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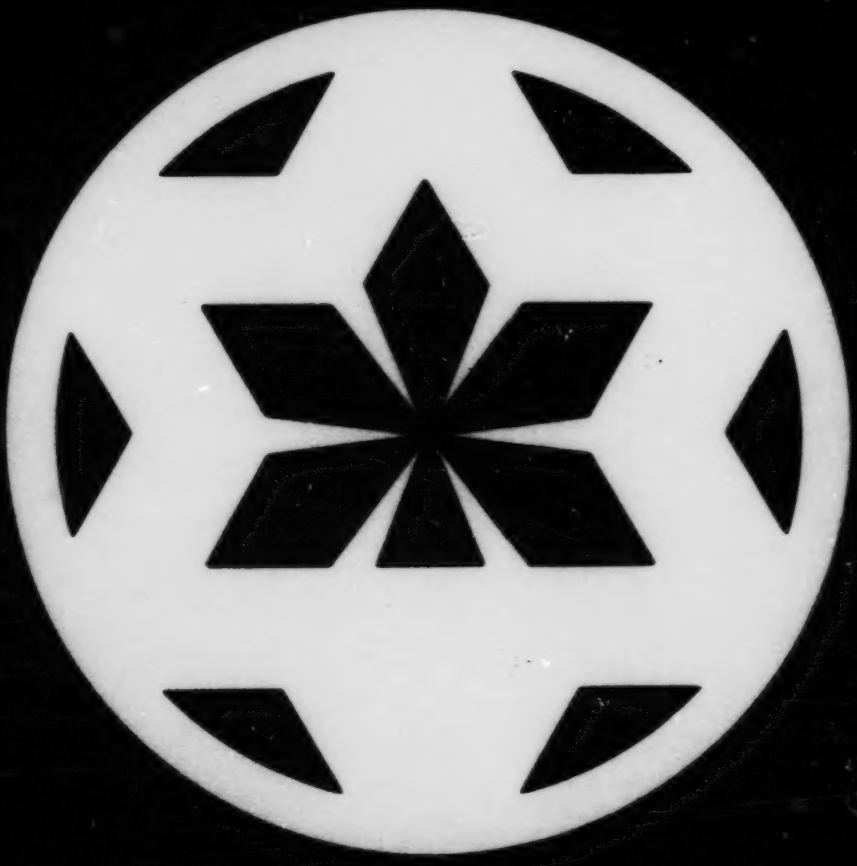

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CURRENT RESEARCH IN THE GEOLOGICAL SCIENCES IN CANADA, MAY 1982 - APRIL 1983

PROJETS DE RECHERCHE EN COURS D'EXÉCUTION AU CANADA - SCIENCES GÉOLOGIQUES. MAI 1982-AVRIL 1983

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1983

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CONTENTS/TABLE DES MATIERES

INTRODUCTION

1 AREAL MAPPING, 1:50 000 OR MORE DETAILED/
CARTOGRAPHIE, 1:50 000 OU À PLUS GRANDE ÉCHELLE
1 Alberta/Alberta
1 British Columbia/Colombie-Britannique
1 Manitoba/Manitoba
2 New Brunswick/Nouveau-Brunswick
2 Newfoundland/Labrador/Terre-Neuve/Labrador
3 Northwest Territories/Territoires du Nord-Ouest
3 Ontario/Ontario
4 Québec
4 Saskatchewan/Saskatchewan
4 Yukon Territory/Territoire du Yukon

5 AREAL MAPPING, LESS DETAILED THAN 1:50 000/
CARTOGRAPHIE, À PLUS PETITE ÉCHELLE QU'AU 1:50 000
5 British Columbia/Colombie-Britannique
5 Manitoba/Manitoba
5 Newfoundland/Labrador/Terre-Neuve/Labrador
6 Northwest Territories/Territoires du Nord-Ouest
6 Ontario/Ontario
6 Québec
7 Saskatchewan/Saskatchewan

7 ENVIRONMENTAL GEOSCIENCE/SCIENCES DE LA TERRE
APPLIQUÉES A L'ENVIRONNEMENT

9 GEOCHEMISTRY/GÉOCHIME
9 Analytical methods and analysis/Méthodes analytiques et analyses
9 Exploration, organic/Appliquée, organique
9 Exploration, non-organic/Appliquée, non-organique
11 General/Généralités

12 GEOCHRONOLOGY/GÉOCHRONOLOGIE

14 GEOLOGICAL COMPUTER APPLICATIONS/APPLICATIONS
DE L'INFORMATIQUE À LA GÉOLOGIQUE

14 GEOMATHEMATICS/MATHÉMATIQUE DE LA TERRE

15 GEOMORPHOLOGY/GÉOMORPHOLOGIE

16 GEOPHYSICS/GÉOPHYSIQUE
16 Electrical/Méthodes électriques
16 Exploration/Prospection
16 Geomagnetism-paleomagnetism/Géomagnetisme-paléomagnétisme
17 Geothermal/Géothermique
17 Gravity/Gravité
17 Seismology and physics of interior/Sismologie et
et physique de l'intérieur de la terre
18 Other/Autre

18 GEOTECHNIQUE/GÉOTECHNIQUE
18 Engineering geology/Géologie de l'ingénieur
19 Permafrost/Pergélisol
20 Rock mechanics/Mécanique des roches
21 Soil mechanics/Mécanique des soils
21 Snow and ice/Neige et glace

21 GLACIOLOGY/GLACIOLOGIE

22 HYDROGEOLOGY/HYDROGÉOLOGIE

24 MARINE GEOSCIENCE/OCEANOGRAPHIE

25 MINERAL/ENERGY GEOSCIENCE/SCIENCES DE LA TERRE APPLIQUÉES AUX MINÉRAUX ET A L'ÉNERGIE
25 Coal geology/Géologie du charbon
25 Industrial minerals/Substances minérales industrielles
27 Mineral deposition exploration/evaluation/Recherche et évaluation des gîtes de minéraux
31 Petroleum exploration/evaluation/Recherche et évaluation des gîtes de pétrole
32 General/Généralités

33 MINERALOGY/CRYSTALLOGRAPHY/ MINÉRALOGIE/CRISTALLOGRAPHIE

35 PALEONTOLOGY/PALÉONTOLOGIE
35 Invertebrate/Invertébrés
37 Vertebrate/Vertébrés
39 Paleobotany/palynology/Paléobotanique et analyse pollinique

42 PETROLOGY/PÉTROLOGIE
42 Experimental/Expérimental
42 Igneous/Roches ignées
43 Metamorphic/Roches métamorphiques
44 Sedimentary/Roches sédimentaires
44 General/Généralités

45 QUATERNARY GEOLOGY/GÉOLOGIE DU QUATERNAIRE

49 REMOTE SENSING/TELÉDETECTION

50 SEDIMENTOLOGY/SÉDIMENTOLOGIE
50 Ancient sediments/Sédiments anciens
53 Recent and unconsolidated sediments/Sédiments récents et non consolidés

54 SOIL SCIENCE/PÉDOLOGIE

54 STRATIGRAPHY/STRATIGRAPHIE
54 Precambrian/Précambrien
55 Paleozoic/Paléozoique
56 Mesozoic/Mésozoique
57 Cenozoic/Cénozoique

57 STRUCTURAL GEOLOGY/TECTONICS/GÉOLOGIE STRUCTURALE/TECTONIQUE
57 Alberta/Alberta
57 British Columbia/Colombie-Britannique
Manitoba/Manitoba
57 New Brunswick/Nouveau-Brunswick
58 Newfoundland/Labrador/Terre-Neuve/Labrador
58 Northwest Territories/Territoires du Nord-Ouest
59 Nova Scotia/Nouvelle-Écosse
59 Ontario/Ontario
60 Québec
60 Yukon Territory/Territoire du Yukon
60 General/Généralités

61 VOLCANOLOGY/VOLCANOLOGIE

62 ORGANIZATIONS REPORTING/ÉTABLISSEMENTS DÉCLARANTS

63 LIST OF GRANT AWARDS IN THE EARTH SCIENCES FOR 1982-83/LISTE DES SUBVENTIONS ATTRIBUÉES AUX SCIENCES DE LA TERRE EN 1982-83

79 RESEARCHER INDEX/INDEX DES CHERCHEURS

INTRODUCTION

The present publication recording research in progress in Canada from May 1982 to April 1983 is the result of a survey conducted between January, 1983 and March, 1983.

The research projects listed in this compilation are being undertaken mainly within federal and provincial departments, and universities. Data on industrial research was not received. A relatively complete overview of scientific research activities within Canada in the geological and allied sciences, however, is provided for the survey period.

Using the data supplied for this compilation by the respondees, some indication as to the lines of research receiving the greatest and least attention can be formulated. At least 464 research projects have not been previously reported. The greatest increase during the 1982-83 period was in the fields of Mineral/Energy Geoscience (70), Geophysics (44) and Geochemistry (41). Research projects undertaken as graduate thesis in the universities are so specified wherever possible.

Additional details on research in the earth and related sciences underway in Canada during 1982 can be obtained through the annual reports prepared by individual university departments, research councils, and museums. Comprehensive reports on geophysical research and development, including volcanology and oceanography related research, are contained within the Canadian Geophysical Bulletin published by the Earth Physics Branch of the Department of Energy, Mines and Resources. Summaries of progress and short research reports related to hydrology/water-related environmental research and glaciology are provided annually by the Water Resources Branch of the Department of Environment Canada and the Associate Committee on Hydrology, National Research Council. Quaternary research in Québec is reviewed annually in the "Bulletin d'information de l'Association québecoise pour l'étude de Quaternaire".

Again this year a listing is included of the 1982 awards provided for geological research within the Research Agreements programs of the Departments of Energy, Mines and Resources, and Environment Canada. The Natural Sciences and Engineering Research Council Canada also provided a computer print-out of the operating grants actually awarded in 1982. The 1982 Ontario Research Grants and Polar Continental Shelf Project field support to non-governmental activities are also listed.

Use of the compilation

The projects are grouped under main headings that cover the majority of disciplines within the geological and allied sciences. These groupings are unchanged from last years compilation (Geological Survey of Canada, Paper 82-5, 1982).

A complete list of organizations contributing to the present survey is included. Acknowledgment is made in particular to those who assembled and forwarded the data on research projects underway in the organizations under their direction. As a convenience, an alphabetically arranged index lists each investigator and the reference number(s) of his project(s).

INTRODUCTION

La présente publication, qui fait état de la recherche réalisée au Canada de mai 1982 à avril 1983, est le fruit d'une enquête effectuée entre Janvier 1983 et mars 1983.

Les projets de recherche enumérés sont exécutés surtout par des ministères fédéraux et provinciaux, et par des universités. Les données sur la recherche industrielle n'ont pas été reçues. Un aperçu assez complet de l'activité de recherche scientifique au Canada pour la periode visée dans le domaine de la géologie et des sciences connexes est cependant fourni.

À partir des renseignements donnés par les participants à l'enquête, il est possible de voir quels genres de recherche retiennent le plus et le moins l'attention. Au moins 464 projets nous ont été signalés pour la première fois. Les domaines où la recherche s'est le plus accrue durant l'année 1982-1983 sont les sciences de la Terre-Énergie/Minéraux (70), la géophysique (44), et la géochime (41). Les projets de recherche de 2e cycle, dans les universités, sont également précisés, dans la mesure du possible.

On peut se procurer de plus amples détails sur la recherche réalisée en 1982 au Canada dans le domaine des sciences de la Terre et des sciences connexes en consultant les rapports annuels mis au point par les différents départements l'universités, conseils de recherche et musées. Le volume du Canadian Geophysical Bulletin, publié par la Direction de la physique du Globe du ministère de l'Énergie, des Mines et des Ressources, comprend des rapports complets sur les travaux de recherche et les dernières réalisations en géophysique, y compris la recherche connexe en volcanologie et en océanographie. Des résumés des progrès réalisés et de brefs rapports ayant trait à la glaciologie et à la recherche environnementale liée à l'hydrologie sont publiés annueullement par la Direction des ressources en eau d'Environnement Canada et par le Comité associé de l'hydrologie, du Conseil national de recherches du Canada. La recherche sur le Quaternaire au Québec est signalée anneullement dans le "Bulletin d'information de l'Association québecoise pour l'étude du Quaternaire".

Nous incluons à nouveau cette année une liste des prix décernés en 1982 pour la recherche géologique dans le cadre des programmes d'accords de recherches des ministères de l'Énergie, des Mines et des Ressources, et de l'Environnement. Le Consiel de recherches en sciences naturelles et en génie du Canada a également fourni un imprimé d'ordinateur détaillant les subventions aux travaux réellement accordées en 1982. On a signalé également dans ce rapport les subventions de recherche de la Commission Géologique de l'Ontario (Ontario Research Grants) et l'aide de l'Étude du plateau continental polaire en faveur d'activités non gouvernementales pour 1982.

Présentation

Les projets sont groupés sous des titres généraux s'appliquant à la majorite des disciplines que comprennent la géologie et les sciences connexes. Ces catégories sont les mêmes que l'année dernière (Étude 81-5, Commission géologique du Canada, 1982).

Une liste complète des organismes qui ont contribué à l'enquête a été dressée. Nous tenons à remercier particulièrement les personnes qui ont recueilli et envoyé les données concernant les projets de recherche en cours dans les organismes dont elles sont responsables. Pour vous faciliter la consultation, un répertoire alphabétique donne les noms de tous les enquêteurs et le(s) numero(s) de référence de son(ses) projets(s).

ALBERTA/ALBERTA

1. GODFREY, J.D., Alberta Research Council (Geol. Surv.):

   Geology of the Ryan-Fletcher Lake district, northeastern Alberta, 1972-83.

   Maps and report in press.

2. GODFREY, J.D., Alberta Research Council (Geol. Surv.):

   Geology of the Bocquene-Turtle Lakes district, northeastern Alberta, 1973-83.

   Map compilation complete, report in preparation.

3. GODFREY, J.D., LANGENBERG, C.W., Alberta Research Council (Geol. Surv.):

   Geology of south Fitzgerald-Myers-Daly Lakes, northeastern Alberta, 1973-84.

   Map compilation and supporting laboratory studies completed.

4. GODFREY, J.D., LANGENBERG, C.W., Alberta Research Council (Geol. Surv.):

   Geology of North Fitzgerald – Tulip – Mercredi Lakes district, northeastern Alberta, 1979-84.

   Map compilation and supporting laboratory studies completed.

5. OLLERENSHAW, N.C., Geol. Surv. Can.:
   Geology of the southern Alberta Foothills, Highwood River to Athabasca River, 1970-.

BRITISH COLUMBIA/ COLOMBIE-BRITANNIQUE

6. ALLDRICK, D.J., McMILLAN, W.J., British Columbia Ministry Energy, Mines, Petrol. Res., (Geol. Br.):

   Salmon River project (NTS 104B), British Columbia, 1982-83.

   In July, 1982 the Ministry initiated a study of the geological setting of precious metal deposits in the Salmon River Valley which trends north from Stewart for 35 kilometres. The district is one of the most active exploration areas in British Columbia and represents a distinct metallogenic terrane in the region. The precious metal deposits occur in a variety of structural settings but all the major deposits are hosted within one thick andesitic unit in a differentiated volcanic sequence of Jurassic age. The deposits can be classified according to their geologic setting as 1) stratabound deposits of undetermined origin and 2) epigenetic vein deposits.

   Continuing studies include regional mapping, ore and host rock petrology and geochemistry, isotope analyses, fossil and radiometric dating.

7. CHURCH, B.N., ROBERTSON, S., British Columbia Ministry Energy, Mines, Petrol. Res.:

   Geology and mineral deposits of the Greenwood area, British Columbia, 1981-.

   A continuing study of the mineral deposits of the Greenwood area which includes an investigation of the local structures and stratigraphy.

8. DANNER, W.R., NESTELL, M.K., SADA, K., Univ. British Columbia (Geological Sciences):

   Carboniferous and Permian rocks of the Kamloops-Harper Ranch area, south-central British Columbia, 1981-83.

   To present a detailed map of the Harper Ranch area northeast of Kamloops, British Columbia to show the distribution of the Harper Ranch Group composed of Carboniferous and Permian limestones and associated sedimentary and volcanic rocks and its special relationship to overlying and tectonically associated Triassic rocks. Discuss the micropaleontology of the limestones and their evidence for environment and plate tectonic setting, and to define the Harper Ranch Group (formerly described as part of the Cache Creek Group) which is now known to have been deposited on a different microplate than the Cache Creek Group.

9. DODDS, C.J., Geol. Surv. Can.:

   Geology of Skagway (104 M) map-area, British Columbia, 1982-.

10. EASTWOOD, G.E.P., British Columbia Ministry Energy, Mines, Petrol. Res. (Geol. Br.):

    Upper Renfrew Creek area, Vancouver Island, British Columbia, 1976-82.

    The area constitutes part of the roof zone of a Jurassic batholith. Triassic basalt and limestone have been intruded by apophyses of tonalite, trondhjemite, and intrusive breccia. Eleven zones of magnetite and/or chalcopyrite mineralization were found in 1970-75 and some were drilled in 1972-74 by Reako Explorations. The area was mapped in 1976-77 and copies of drill-core assays were obtained from the company. As time permitted, calculations of tonnage and grade were made for the drilled zones and estimates made for the others from field observations. Maps were completed for final draughting in 1982.

11. EASTWOOD, G.E.P., British Columbia Ministry Energy, Mines, Petrol. Res. (Geol. Br.):

    Geology of the Quinsam area, Vancouver Island, British Columbia, 1977-83.

    Mapping of an area centred on Middle Quinsam Lake was done in 1977-79 to outline coal-bearing beds of the Nanaimo Group and provide a framework for estimating coal reserves. Sections were constructed from drillers' logs, seams correlated lithologically, and reserves calculated. In 1982 the mapping was extended to answer some questions regarding the surrounding older rocks and to assist mineral exploration. A sample of heavily pyritized Lower Bonanza beds toward Strathcona Dam had assayed 0.1% copper, and copper-zinc prospects were known west and southeast of Gentian Lake. The northwest and southeast contacts of the Quinsam stock of the Island Intrusions were delineated, and the prospects west of Gentian Lake were found to be in narrow shear zones in the stock. The top of the Lower Bonanza was located in the Iron River, demonstrating that the tower-forming volcanic rocks south of the Nanaimo beds and east of Gentian Lake are Middle Bonanza.

12. GETSINGER, J.S., GREENWOOD, H.J., ROSS, J.V., McTAGGART, K.C., ARMSTRONG, R.L., Univ. British Columbia (Geological Sciences):

    Metamorphism and structure of Three Ladies Mountain area, Cariboo Mountains, British Columbia, 1979-83; Ph.D. thesis (Getsinger).

    Sees:

    Metamorphism and structure of Three Ladies Mountain area, Cariboo Mountains, British Columbia; Geol. Surv. Can., Paper 82-1A, p. 317-320, 1982.

    During the 1982 summer field season, mapping was extended northeast into the hanging wall of the Little River Fault to determine the deformational history of the lower-grade rocks. Intercalated marbles and phyllites, still considered to belong to Cariboo Group (latest Proterozoic to Cambrian), show similar F2 to F4 fold history to that in the footwall schists and gneisses of the Snowshoe Fm. (age unknown), but appear to lack the earliest fold phase (F1) recognizable in the underlying Snowshoe Formation. In the hanging wall rocks, both F2 and F3 folding was accompanied by greenschist facies recrystallization along axial planar cleavages, whereas in the footwall rocks there is a marked change in metamorphic grade between F2 and F3 folding. This evidence supports an interpretation of fault movement in which the footwall was uplifted relative to the hanging wall between fold phases F2 and F3.

    Twenty types of structural measurements have been plotted (by computer) for twelve domains, confirming four distinct fold phases as outlined in the previous report. A summary of the deformational history has been written, and a map is being prepared. Radiometric dating has been started on zircons from early syn-deformational quartz diorite sills. Current laboratory work in metamorphism and dating is expected to be completed during summer 1983.

13. ISACHSEN, C.J., ARMSTRONG, R.L., Univ. British Columbia (Geological Sciences):

    Geology, geochronology and geochemistry of the Westcoast Crystalline Complex near Tofino, British Columbia, 1980-83; M.Sc. thesis (Isachsen).

    Detailed geologic mapping of Meares Island and vicinity near Tofino, British Columbia, was carried out during the summer of 1981. Samples were collected at that time for radiometric dating (U/Pb, K/Ar, Rb/Sr and fission track), major and trace element analysis, and petrographic analysis.

    The rocks are part of the Westcoast Crystalline Complex, a somewhat continuous belt paralleling the west coast of Vancouver Island. They consist primarily of gneissic and migmatitic to massive and homogenous plutonics which have incorporated amphibolitic "country rock" as well as some calc-silicates.

    Geochronology completed thus far indicates a Jurassic age for the complex and the major element chemistry shows a dominantly calc-alkaline trend. It is suggested, therefore, that these rocks may represent a deep crustal equivalent of the Jurassic Island Intrusions, intruded syntectonically, and perhaps exposed at a later time by uplift along steep reverse faults related to subduction of the Farallon plate.

    These rocks were intruded subsequently during a Tertiary plutonic phase.

14. McMECHAN, M.E., Geol. Surv. Can.:
    Detailed geological study of selected areas within the Foothills and Rocky Mountain Belts between Peace River and Smoky River with emphasis on structure, British Columbia and Alberta, 1981-.

15. RAY, G.E., British Columbia Ministry Energy, Mines, Petrol. Res. (Geol. Br.):

    Carolin Mine – Coquihalla Gold Belt Project, British Columbia, 1981-84.

    Sees:

    British Columbia Ministry of Energy, Mines and Petrol. Res., Paper 1982-1, p. 87-101, 1982.

    The project involves regional geological mapping of the Coquihalla gold belt, with detailed structural and geochemical studies of areas containing gold mineralization, including the Carolin mine deposit. Work is orientated towards unravelling the regional structural setting of the Coquihalla serpentine belt, understanding the controls of gold mineralization for further gold exploration.

16. WOODSWORTH, G.J., Geol. Surv. Can.:
    Eastern margin of the Coast Plutonic Complex, British Columbia, 1980-.

MANITOBA/MANITOBA

17. BAILES, A.H., SYME, E.C., Manitoba Dept. Energy and Mines (Geol. Services Br.):

Flin Flon-Schist Lake project, Manitoba, 1982-83.

See:

Manitoba Dept. Energy and Mines, Mineral Res. Div., Report of Field Activities 1982, p. 15-17.

To provide a sound geological base for future exploration for volcanogenic massive sulphide deposits in the Flin Flon-Schist Lake area. To achieve this, 1:20 000 scale mapping and detailed examination of volcanological features and processes have been undertaken. This project is an extension of the mapping program begun in the adjacent White Lake-Mikanagan Lake area in 1979.

18. HERD, R.K., Geol. Surv. Can.:
Geology of the Island Lake map-area (53 E), Manitoba and Ontario, 1976-.

NEW BRUNSWICK/ NOUVEAU-BRUNSWICK

19. SEAMAN, A.A., BARNETT, D.E., New Brunswick Dept. Nat. Res. (Mineral Development Br.):

Granular aggregate resources of the Blackville (21 I/12) map-area, New Brunswick, 1982-83.

Field mapping and sampling of surficial deposits was carried out in the Blackville map-area of New Brunswick. This project was undertaken so as to provide basic information pertaining to the location and extent of surficial geologic units in the area, with particular emphasis on the quality and quantity of material available from those units with aggregate potential.

NEWFOUNDLAND/LABRADOR/ TERRE-NEUVE/LABRADOR

20. COLMAN-SADD, S.P., Newfoundland Dept. Mines and Energy:

Geologic mapping, Bay D'Espoir, Newfoundland, 1976-.

See:

Geology and mineral potential of south-central Newfoundland; Newfoundland Dept. Mines and Energy, Rept. 82-8, 1982.

Mapping at 1:50 000 scale completed for Gaultois (1M/12), St. Alban's (1M/13), Twillick Brook (2D/6), Burnt Hill (2D/5), West Gander Rivers (2D/11) and Cold Spring Pond (12A/1).

21. DICKSON, W.L., Newfoundland Dept. Mines and Energy:
Geology of the North Bay Granite, southern Newfoundland, 1982-84.

See:
Geology of the D'Espoir Brook map area and part of the Facheux Bay map area, south-central Newfoundland; Geol. Surv. Can., Paper 83-1A, p. 285-290, 1983.

During 1983, the adjacent map area to the west will be mapped, and geochemical samples analysed. This will complete 1:50,000 mapping of the North Bay Granite.

22. HERD, R.K., Geol. Surv. Can.:
Geology of Red Indian Lake, west-half, Newfoundland, 1977-83.

23. KNIGHT, I., Newfoundland Dept. Mines and Energy:
Daniel's Harbour – 1:50 000 regional mapping, Great Northern Peninsula, Newfoundland, 1976-84.

See:

Preliminary conodont biostratigraphy and correlation of Lower to Middle Ordovician carbonates of the St. George Group, Great Northern Peninsula, Newfoundland; Newfoundland Dept. Mines and Energy, Rept. 82-3, 1983.

Fossils of northwestern Newfoundland and southeastern Labrador: conodonts and trilobites; Newfoundland Dept. Mines and Energy, Rept. 83-3, 1983.

Continued 1:50 000 mapping of the Cambro-Ordovician platformal rocks of Western Newfoundland. This will occur in the area between Port au Choix and Daniel's Harbour. It is hoped to continue biostratigraphic studies on important sections during the course of this mapping.

24. WILLIAMS, H., QUINN, L., NYMAN, M., Memorial Univ. (Earth Sciences):
Regional Mapping, Lomond area and related theses studies, 1982-83; M.Sc. theses (Quinn, Nyman).

See:
Humber Arm allochthon at South Arm, Bonne Bay, west Newfoundland; Geol. Surv. Can., Paper 83-1A, p. 179-182, 1983.

Geologic mapping of the Lomound area was begun in 1982. Quinn has completed field work at South Arm, Bonne Bay in the Lomond area. Nyman starts in the Lomond area 1983.

NORTHWEST TERRITORIES/ TERRITOIRES DU NORD-OUEST

25. EADE, K.E., Geol. Surv. Can.:
Geology of the Tulemalu Lake map-area, District of Keewatin, 1975-.

26. EASTON, R.M., Indian and Northern Affairs Canada:
Compilation of geology of the Hepburn Island area (76 M), Slave Province, Northwest Territories, 1982.

Preliminary map shows geological information from 1:50 000 and 1:30 000 scale mapping in parts of 76 M (76 M/1, 6 N 1/2, 7, 10, 11, 13 S and 14 S) by various G.S.C., D.I.A.N.D. and industry staff and correlates it with Frasers (1964) helicopter reconnaissance. Mineral deposits and showings found mainly by industry in the past decade are shown. Future work is proposed to update areas of 76 M for which only helicopter reconnaissance data is presently available. These will be reported as 1:50 000 mapping when done.

27. EASTON, R.M., ELLIS, C., DEAN, M.E., BAILEY, G. BRUNEAU, H.C., WAHLROTH, J., Indian and Northern Affairs Canada:
Geology of Typhoon Point area. High Lake Greenstone Belt 76 M/11, Northwest Territories, 1982.

See:

DIAND EGS 1982-6, 1982.

Geological mapping of the High Lake volcanic belt, Slave Province, Northwest Territories – a sequence of Archean rocks containing volcanogenic massive sulphide deposits. Surficial geology (Bruneau and Wahlroth) was also mapped, and will be the subject of a separate study by Bruneau. This project is part of detailed mapping of NTS 76/M which will continue in 1983 (76 J-4, 5 & 6). Ultimately all of 76 M is to be mapped.

28. EASTON, R.M., ELLIS, C., HELMSTAEDT, H., JACKSON, V., O'HEARN, B., DEAN, M.E., Indian and Northern Affairs Canada:

Geological mapping, east side of Yellowknife Bay, Northwest Territories, 1982.

See:

Geology of the east side of Yellowknife Bay; DIAND EGS 1982-5a, 5b, 5c, 1982.

To map in detail the east side of Yellowknife; to study the Duck Lake volcanics and compare and contrast these to the Kam Formation, host to gold deposits at Yellowknife.

29. HENDERSON, J.B., Geol. Surv. Can.:
Yellowknife and Hearne Lake map-areas, District of Mackenzie, 1970-.

See:

A U-Pb study of zircon from granitic basement beneath the Yellowknife Supergroup, Point Lake, District of Mackenzie; Geol. Surv. Can., Paper 82-1C, p. 173-177, 1982.

30. HENDERSON, J.B., Geol. Surv. Can.:
Keskarrah Bay map-area, District of Mackenzie, 1976-.

31. HOFFMAN, P.F., Geol. Surv. Can.:
East arm of Great Slave Lake, District of Mackenzie, 1966-.

32. MORROW, D.W., Geol. Surv. Can.:
Southwestern Ellesmere – western Devon Islands (Operation Grinnell), District of Franklin, 1967-.

33. PADGHAM, W.A., ROSCOE, S.M., VAN SCHMUS, W.R., BOWRING, S.A., Indian and Northern Affairs Canada, Geol. Surv. Can., Univ. Kansas:
Anialuk River granite gneiss, Northwest Territories, 1980-83.

See:

Aniahuk Gneiss: 2.7 Ga-OLD anatectite, Slave Province, N.W.T.; Geol. Assoc. Can. – Mineral. Assoc. Can., Program with abstracts, vol. 8, p. A32, 1983.

The Anialik River granite gneiss on Coronation Gulf near the northwest edge of the Archean Slave Craton is of special interest because it hosts extensive auriferous quartz veins and because it is an inadequately documented granitoid phase indicating anatexis of pre-Yellowknife Supergroup basement about 2700 Ma. The granite gneiss, a subelliptical pluton invaded supracrustals that are folded around the intrusion and strongly deformed against it. Supracrustal zircons give almost the same age as zircons from the gneiss. Most of the pluton is a weakly- to strongly-foliated, coarse-grained, greyish-white to slightly pinkish biotite tonalite. Its western and northern margins contain locally abundant mafic inclusions, rafts of diorite, and a multiplicity of felsic granitoids cutting older more mafic ones, various white to brick-red pegmatites and aplites, quartz breccia zones and quartz veins, some of which fill fractures in pinkish aplite. Mafic dykes and late carbonate veins are also present. The eastern and southern borders are strongly cataclastic, (Tirrul and Bell, 1980). Even the most massive parts of the gneiss, display cataclastic deformation, extensive sericitization of plagioclase, and alteration of biotite to sericite and chlorite. Small amounts of microcline, perthite and myrmekite, are widespread in border zones, and along fractures and shears elsewhere. Northeasterly-trending mafic dykes cutting the gneiss, but not the supracrustals, have a foliation and locally a schistosity subparallel to their walls.

Two samples of tonalite gave U-Pb zircon ages of 2692 ± 2 Ma and 2694 ± 8 Ma. A similar date (2700 ± 10 Ma, Scharer and Allegre 1982) for part of the sedimentary zircon from Yellowknife Supergroup greywacke collected on Point Lake was ascribed to "intracontinental sialic crust accretion".

34. TAYLOR, F.C., Geol. Surv. Can.:
Geology of Whitehills Lake, District of Keewatin, 1980-.

35. Tella, S., Geol. Surv. Can.:
Geology of Amer Lake map-area, District of Keewatin, 1976-82.

36. THORSTEINSSON, R., Geol. Surv. Can.:
Cornwallis and adjacent smaller islands, District of Franklin, 1965-.

37. VAN SCHMUS, W.R., BOWRING, S.A., Univ. of Kansas (Geology):
Geology and geochronology of Wopmay Orogen, Northwest Territories, Canada, 1979-83; Ph.D. theses (Bowring)

We have been working in cooperation with Paul Hoffman and Robert Hildebrand of the GSC in trying to understand better the geologic development of Wopmay Orogen. Our specific contributions have been through U-Pb geochronology of the Hepburn and Wentzel Batholiths, the Great Bear Magmatic Zone, and the Hottah Terrane with detailed mapping of Dumas Group rocks of the Adam Lake and Kamut Lake map areas (86 K/8 and 86 K/9).

Initial results (1982) show that Wopmay Orogen developed over the interval 1900 to 1840 m.y. ago. Details will be presented in papers in preparation. Field work is helping to understand the nature of the Wopmay Fault and work will continue on that problem during the 1983 field season. Further geochronologic work will be concentrated on understanding the nature of the Hottah Terrane and the relationships among it, rocks of the Orogen, and the Archean basement as regional mapping proceeds southward.

ONTARIO/ONTARIO

38. BENNETT, G., Ontario Geol. Surv.:
Jarvis Lake – Garden River area, District of Algoma, Ontario, 1976-83.

39. GIBLIN, P.E., Ontario Geol. Surv.:
Precambrian geology of Garson twp., District of Sudbury, Ontario, 1982-83.

See:
Ontario Geol. Surv., Misc. Paper 106, 1982.

Metavolcanic and metasedimentary rocks of the Huronian Supergroup underlie the southern one third of the area. Rocks of the Onaping Formation, Whitewater Group, underlie a narrow strip in the northern part of the area. Rocks of the Sudbury Igneous Complex intrude those of the Huronian Supergroup and the Whitewater Group, and underlie the central half of the twp. Major Cu-Ni deposits occur at the contact of the Complex and the Huronian Supergroup. One producing mine and one past producer occur in the area.

40. JACKSON, M.C., THURSTON, P.C., Ontario Geol. Surv.:
Geology of the Lumby Lake area, northwestern Ontario, 1982-84.

See:

Geology of the Lumby Lake area (eastern half), Districts of Kenora and Rainy River; Ontario Geol. Surv., Misc. Paper 106, p. 57-60, 1982.

The first year of a two year project to map the Lumby Lake area was spent in the eastern half of the area. Semi-detailed mapping, at a scale of 1 inch = 1/4 mile, was concentrated on the greenstone belt between 91°00' and 91°15'W. The belt is dominated by mafic metavolcanic rocks of upper greenschist to amphibolite metamorphic facies. Thin units of felsic metavolcanic rocks and numerous oxide and sulfide facies ironstones occur within the mafic metavolcanics. The sequence is capped by a thick (500 m) unit of chemical metasediments overlain by pelitic metasediments in the core of a central east-west trending syncline.

41. JOHNS, G.W., Ontario Geol. Surv.:
Geology of the Long Bay area; District of Kenora, Ontario, 1982-84.

See:
Long Bay area, District of Kenora; Ontario Geol. Surv., Misc. Paper 106, p. 15-18, 1982.

Precambrian Geology of the MacQuarrie Township area, Kenora District; Ontario Geol. Surv., Prel. Map P. 2498, 1982.

Detailed mapping continued in the eastern Lake of the Woods area of the Wabigoon Subprovince of the Superior Province. Two stratigraphic assemblages have been defined. They can not be correlated as they are separated by the regional Pipestone-Cameron Fault. Southwest of the fault high iron tholeiitic mafic metavolcanics of the Snake Bay Formation outcrop. Northeast of the fault an assemblage called the Warclub sediments are lithologically complex and should be called the Warclub group. Intermediate to felsic metavolcanics of the Berry Complex, mafic flows and wackes overlie the Warclub group. The group has been intruded by differentiated mafic sills similar to those in the Kakagi Lake area.

The supracrustal rocks have been intruded by the Aulneau Batholith, the Dryberry Batholithic Complex and the Regina Bay Tonalite. This has resulted in multiphase deformation of the intruded rocks. Gold mineralization is associated with the contact of the Regina Bay Tonalite and the Snake Bay Formation. A post-tectonic, zoned, potassium feldspar phyric stock intrudes the eastern extension of the Berry Complex and the Warclub group. Northwest trending Proterozoic diabase dikes are related to extensional tectonics in the Superior Province.

42. MARTINS, J.M., DRESSLER, B.O., Ontario Geol. Surv.:
Blezard tp., District of Sudbury, Ontario, 1982-83.

The Sudbury Igneous Complex intrudes the central part of Blezard Tp. Huronian sediments and volcanics form the footwall to the southeast; the Murray granite intrudes the Huronian. The Complex is overlain by the Onaping and Onwatin formations of the Whitewater Group. One producing mine (Little Stobie) and several past producers are located at the contact between the Complex and the Huronian rocks.

43. MASSEY, N.W.D., Ontario Geol. Surv.:
Geology of the Mishewawa Lake area, District of Algoma, Ontario, 1982-84.

Geologically, the area lies on the southern margin of the Wawa Belt. The metavolcanic succession is dominated by mafic metavolcanic (massive and pillowed flows, with chloritic tuffs and schists) with lesser amounts of intermediate to felsic tuffs and crystal tuffs. Chemical metasediments are thin and discontinuous. The metavolcanics are intruded by mafic (gabbro-diorite) bodies, some of which are apparently concordant sills, and by crosscutting felsic stocks. The greenstone margin is marked by a heterogeneous, mixed granite-greenstone zone upto a kilometre wide.

At least two phases of deformation are discernible within the metavolcanics. The first produced a steeply dipping foliation subparallel to bedding, although axial planar to small folds in BIF and within tuffs and schists. Shearing in metavolcanics and intrusives is often parallel to the foliation. The first foliation was later deformed to produce crenulation cleavages and kink bands.

Major fold structures have not, however, been recognized yet due to the lack of continuous horizons. Several major faults cut the area with southeasterly and northeasterly trends. Offsets are usually sinistrial. Movement along faults may have occurred upto and in the Keweenawan Period.

44. OWSIACKI, L., Ontario Geol. Surv.:
Geology and mineral potential of Lundy township, Ontario, 1981-83.

See:
Geology of Lundy township (northern half), District of Timiskaming; Ontario Geol. Surv. Misc. Paper 106, 1982.

To determine the structure, stratigraphy and mineral potential of Lundy township. The geology of the township consists of relatively flat-lying sediments of the Huronian Supergroup intruded by large gabbroic sill-like bodies of Nipissing-type diabase. Geological mapping has been completed. Metallic mineralization has been described and the interpretation of trace element data for lithologies is in progress.

45. PAUK, L., Ontario Geol. Surv.:
Geology of Lavant area, eastern Ontario, 1982-83.

46. RUSSELL, D.J., Ontario Geol. Surv.:
Paleozoic geology of the Sault Ste. Marie area, Ontario, 1983-.

Field mapping, interpretation of environment of deposition and age of the Jacobsville Sandstone, mapping of Lower Paleozoic sedimentary rocks of St. Joseph Island.

47. STOTT, G.M., Ontario Geol. Surv.:
Geology of Meen Lake area, Ontario, 1982-83.

See:
Meen Lake area, District of Kenora (Patricia portion); Ontario Geol. Surv., Misc. Paper 106, p. 10-14, 1982.

A detailed 1:15 840 scale survey on a greenstone belt and adjacent granitoid terrain 80 km west of Pickle Lake, northwestern Ontario has delineated three supracrustal groups including a felsic volcanic suite with centre of volcanism identified. Tectonic sequence of events among granitoids and supracrust is defined.

48. SUTCLIFFE, R.H., GREENWOOD, R.C., THURSTON, P.C., FYFE, W.S., Ontario Geol. Surv., Univ. Western Ontario (Geology):

Petrology and tectonics of the Nipigon Basin, Ontario, 1981-83; Ph.D. thesis (Sutcliffe).

See:
Geology of the Lake Nipigon area; Ontario Geol. Surv., Misc. Paper 106, p. 19-23, 1982.

49. THURSTON, P.C., Ontario Geol. Surv.:
Atikokan-Lakehead compilation sheet, Ontario, 1983-85.

Compilation and field checking at 1:250 000.

50. WILLIAMS, D., Ontario Geol. Surv.:
Ordovician geology of the Ottawa-St. Lawrence Lowland, Ontario, 1981-.

QUÉBEC

51. BÉLANGER, M., FRANCONI, A., Québec Ministère Énergie et Ressources:
Rivière George, Nord-est du Québec, 1983-.

Faire la cartographie géologique au 1:50 000 du territoire situé à l'est de la Fosse du Labrador. Approfondir les connaissances géologiques sur des cibles trouvées par des levés régionaux de géochimie.

52. CHARBONNEAU, J-M., FRANCONI, A., DUPUIS-HÉBERT, L., PICARD, C., BRANGIER, M., DUBÉ, C., OTIS, M., CHARTRAND, F., HÉBERT, Y., Univ. Claude Bernard à Lyon (France), Québec Ministère Énergie et Ressources:
Chapais-Bransaat, Québec, 1980-84; thèses de doctorat (Picard, Brangier).

Voir:
Géologie des unités stratigraphiques affleurant dans les cantons de Daubrée, Dolomieu, Saussure et La Ribourde, Abitibi-Est; Québec Ministère Énergie et Ressources, ET-82-01, article I, 1983.

Région du Lac Thomelet; district de Chibougamau; ibid., carte préliminaire annotée DP-82-13, 1983.

Géologie des cantons de Lamarck et de Guettard; ibid., ET-82-01, article IV, 1983.

Le Groupe d'Opémisca dans le secteur du lac Landing, cantons de Daubrée et de Dolomieu; ibid., ET-82-01, article II, 1983.

Géologie de la région du lac Trève; ibid., ET-82-01, article III, 1983.

Demie nord du canton de Daubrée; ibid., carte préliminaire annotée DP-928, 1982.

Région du lac Inconnu, district de Chibougamau; ibid., carte préliminaire annotée, DP-82-11, 1982.

53. de ROMER, H.S., Québec Ministère Énergie et Ressources:
Géologie des Monts Stoke, L'Estrie, Québec, 1980-83.

Voir:
Géologie de la part sud des Monts Stoke; Québec Ministère Énergie et Ressources, DPV 822, 1982.

Compilation of the structure and stratigraphy of the Stoke Mountains, Quebec.

54. HÉBERT, Y., FRANCONI, A., Québec Ministère Énergie et Ressources:
Lac à l'Eau Jaune, Abitibi-Est, Québec, 1983-86.

Cartographie de la région du Lac à l'Eau Jaune dans la bande volcano-sédimentaire Quévillon – Lac Caopatina.

55. IMREH, L.I., BEULLAC, R., LACOSTE, P., Québec Ministère Énergie et Ressources:
Gîtologie prévisionnelle, volcanologie et lithostratigraphie de l'Abitibi-méridional (Québec), 1982-86.

Les travaux constitueront la continuation régionalisée du projet amorcé en 1972. En 1983, axée à la fois sur le volcanisme type plaine sous-marine et type arc insulaire, la continuation des travaux visera: 1) la jonction cartographique des investigations effectuées sur les deux flancs de l'anticlinal majeur de La-Motte-Vassan; and 2) la mise en évidence des édifices volcaniques favorables à la minéralisation Cu-Zn-Ag-fère et à la minéralisation aurifère et celle des métallotectes spécifiques.

56. SHARMA, K.N.M., FRANCONI, A., LAMOTHE, D., HÉBERT, Y., LAUZIÈRE, K., Québec Ministère Énergie et Ressources:
Projet Capisisit Desmaraisville, Abitibi, Quebec, 1982-84.

Voir:
Gand (Su) et l'Espérance (Nu); Québec Ministère Énergie et Ressources, D.P.V. 852, 1982.

Région du lac Renaud, District de Chibougamau; ibid., D.P.V. 82-10, 1982.

Région du lac Capisisit; ibid., D.P.V. 82-07, 1982.

Ce projet a pour but, la cartographie détaillée de la bande volcanosédimentaire Coopatina Quévillon entre Desmaraisville et le lac Capisisit. Il a débuté en 1981 avec la cartographie au 1:10 000 de la moitié nord du canton de l'Espérance et la moitié sud de Gand. En 1982 la région du lac Relique, Capisisit et Renault a été cartographiée au 1:20 000 et se terminera en 1983 avec la cartographie au 1:20 000 des régions de la Rivière Waswanipi et du lac Bachelor.

57. VEILLETTE, J.J., Geol. Surv. Can.:
Géologie du Quaternaire, région de l'Outaouais supérieur, Québec-Ontario, 1977-.

Voir:
Les polis glaciaires au Témiscamingue: une chronologie relative; Geol. Surv. Can., Paper 83-1A, p. 187-196, 1983.

SASKATCHEWAN/SASKATCHEWAN

58. MACDONALD, R., THOMAS, M.W., Saskatchewan Geol. Surv.:
Geology of the Hill Lake area (NTS 74 N, CSMA Photomap Sheet 6500-65900), Saskatchewan, 1982-84.

See:
Saskatchewan Geol. Surv., Misc. Rept. 82-4, 1983.

This mapping (at 1:20 000 scale) is part of a program reviewing the regional geology and mineralization in the Beaverlodge area, Saskatchewan, being conducted by the Saskatchewan Geological Survey. Results are expected to be compiled for open filing or publication by 1984. The opportunity was taken in this project to commence development of a method of field mapping using a minicomputer.

59. SCOTT, B.P., Saskatchewan Geol. Surv.:
The geology of the Phelps Lake area (southwest), Saskatchewan, 1981-83.

Petrographic study of thin sections; analysis of small scale folds; and writing of general geological report.

60. SCOTT, B.P., Saskatchewan Geol. Surv.:
The geology of the Dianne Lake property, Uranium City area (west half), Saskatchewan, 1982-83

Geochemical analysis of Ag, Cu and Ni in profiles across mineralized zone, and study of small-scale folds and thin sections, at the Dianne Lake property. Completion of map illustrating geology of the Thluicho Lake Group and unclassified Precambrian paragneiss and granite, northeast of the Dianne Lake property, at a scale of 1:20 000.

61. SIBBALD, T.I.I., Saskatchewan Geol. Surv.:
Uranium metallogenic studies, Nicholson Bay area, Saskatchewan, 1982-84.

See:
Saskatchewan Geol. Surv., Misc. Rept. 82-4, p. 43-45, 1983.

Geological mapping of the area surrounding Nicholson Bay at 1:20 000 scale. Examination and geochemical sampling of major economic mineral occurrences of uranium and gold in surface outcrops and mine waste piles. Regional sampling of bedrock, particularly granitoids for petrological and geochemical investigation and geochronology (Rb-Sr).

62. THOMAS, D., Saskatchewan Geol. Surv.:
Uranium metallogenic studies, Mickey Lake area, Saskatchewan, 1981-83.

See:
Saskatchewan Geol. Surv., Misc. Rept. 82-4, p. 51-55, 1983.

Detailed 1:10 000 scale geological mapping of the area surrounding Mickey Lake located 15 km northeast of Uranium City and 3 km north of the Ace-Fay-Verna uranium deposits of Eldorado Nuclear Ltd., with the objective of: 1) refining the existing geological understanding (stratigraphy, structural and metamorphic geology) of the area; and 2) evaluating uranium occurrences in the area and models of deposit genesis.

YUKON TERRITORY/ TERRITOIRE DU YUKON

63. CAMPBELL, R.B., Geol. Surv. Can.:
Operation Mount St. Elias, Yukon-British Columbia, 1973-.

64. KLASSEN, R.W., Geol. Surv. Can.:
Surficial geology and terrain evaluation, southern Yukon, 1977-.

65. NORRIS, D.K., Geol. Surv. Can.:
Operation Porucpine, Yukon-District of Mackenzie, 1961-.

66. THOMPSON, R.I., Geol. Surv. Can.:
Stratigraphy and structure of Dawson, Larsen Creek and Nash Creek map areas, Ogilvie Mountains project, Yukon Territory, 1980-.

BRITISH COLUMBIA/ COLOMBIE-BRITANNIQUE

67. GABRIELSE, H., Geol. Surv. Can.:
Operation Finlay, British Columbia, 1970-.

See:
U-Pb measurements on zircon indicate middle Paleozoic plutonism in the Omineca Crystalline Belt, north-central British Columbia; Geol. Surv. Can., Paper 82-1C, p. 139-146, 1982.

68. GABRIELSE, H., Geol. Surv. Can.:
Operation Dease, British Columbia, 1971-.

See:
Stratigraphy and structure of Sylvester Allochthon, southwest McDame map area, British Columbia; Geol. Surv. Can., Paper 82-1B, p. 101-106, 1982.

69. MONGER, J.W.H., Geol. Surv. Can.:
Geology of the Ashcroft and Hope map-areas, British Columbia, 1980-.

70. OKULITCH, A.V., Geol. Surv. Can.:
Kootenay River (NTS 82) map area, 1:1 million Geological Atlas Program, 1970-.

See:
Granite clasts in late Proterozoic conglomerate, southeastern British Columbia; Geol. Surv. Can., Paper 82-1B, p. 277, 278, 1982.

71. REESOR, J.E., Geol. Surv. Can.:
Geology of Nelson map area (E/2), British Columbia, 1979-.

72. RODDICK, J.A., Geol. Surv. Can.:
Coast Mountains project, British Columbia, 1963-.

73. WHEELER, J.O., Geol. Surv. Can.:
Lardeau map-area, British Columbia, 1979-.

74. WOODSWORTH, G.J., Geol. Surv. Can.:
Kemano project, British Columbia, 1977-.

NEW BRUNSWICK/ NOUVEAU-BRUNSWICK

75. McCUTCHEON, S.R., New Brunswick Dept. Nat. Res. (Geol. Surv. Br.):
Mount Pleasant Caldera project, New Brunswick, 1982-84.

To resolve some major stratigraphic problems within the Lower Carboniferous Piskahegan Group, host rocks to the Mount Pleasant tungsten deposit, and to determine the spatial and temporal relationship between mineralization and volcanism.

As a result of the past summers mapping it was found that the Piskahegan Group is divisible into intra- and exo-caldera sequences and further divisible as to whether the rocks are pre-collapse or post-collapse. The details of the intra-caldera sequence remain to be worked out. Alteration and mineralization of Mount Pleasant type preceded emplacement of the post-collapse caldera fill sequence. They are concentrated around the caldera margin and resulted from hydrothermal activity that was largely post-magmatic, i.e. geothermal.

NEWFOUNDLAND/LABRADOR/ TERRE-NEUVE/LABRADOR

76. ERDMER, P., Newfoundland Dept. Mines and Energy:
Geology of the region between Lake Melville and Double Mer, Labrador, 1982-83.

See:
Preliminary report on the geology north of upper Lake Melville, Labrador; Geol. Surv. Can., Paper 83-1A, p. 291-296, 1983.

Mapping at 1:100 000 scale of 3500 km² of the eastern Grenville Province suggests that Aphebian or earlier(?) granitic and tonalitic gneiss complexes, that include supracrustal remnants and metagranitoid rocks, are the oldest rocks of the area. The gneiss complexes were intruded by a late Hudsonian or early Paleohelikian granite pluton, as well as by Paleohelikian anorthositic rocks and later(?) plutons of granite to syenite. A southeast dipping mylonite zone that was probably the locus of thrust faulting coincides with the margin of a half graben filled with Hadrynian(?) conglomerate. Several uranium showings are associated with diatexite developed in parts of the granitic gneiss complex. Strain resulting from the Grenvillian Orogeny is either relatively weak or strongly heterogeneous.

77. ERMANOVICS I., Geol. Surv. Can.:
Archean rocks of the Nain Province in Hopedale (13 N), Snegamook Lake (13 K), and Makkovik (13 O) map-areas, Labrador, 1978-.

See:
Structural and lithological chronology of the Archean Hopedale block and the adjacent Proterozoic Makkovik Subprovince, Labrador: Report 4; Geol. Surv. Can., Paper 82-1B, p. 153-163, 1982.

78. GOWER, C.F., Newfoundland Dept. Mines and Energy:
Lithotectonic and metamorphic subdivision of the Grenville Province in eastern Labrador, 1980-.

The Grenville Province in Eastern Labrador can be subdivided into two major lithotectonic and metamorphic mega-domains 50-75 km wide. The northern mega-domain, informally referred to as the Groswater Bay mega-domain, comprises granodioritic and tonalitic gneisses with minor associated supracrustal rock and intruded by syenite/monzonite plutons and gabbros. The gneisses are assumed to be pre-Hudsonian but reworked in part during the Grenvillian Orogeny. Metamorphic assemblages are characterized especially by kyanite in paragneisses and epidote in quartzo-feldspathic gneisses.

The southern mega-domain, Lake Melville mega-domain, is separated from the Groswater Bay mega-domain by a complex zone of thrusts, and is characterized by a much higher abundance of supracrustal rock, abundant granitoid intrusive rock and near the thrust 'front' a broad zone of layered, leucogabbro intrusions. Granodiorite gneisses are also common. Metamorphic mineral assemblages are characterized by sillimanite in paragneisses, absence of epidote in quartzofeldspathic rocks, and a broad zone of high pressure granulite near the thrust 'front'.

79. GOWER, C.F., BAILEY D.G., FLANAGAN, M., KERR, A., Newfoundland Dept. Mines and Energy:
Geology of the Kaipokok Bay – Big River area, central mineral belt, Labrador, 1977-82.

See:
Newfoundland Dept. Mines and Energy, Rept. 82-7, 1982.

The oldest rocks are quartzofeldspathic gneisses and amphibolites of the Hopedale metamorphic complex, which have experienced repeated deformation and metamorphism, and are interpreted as Archean. These are now in thrust contact (originally an unconformity) with the Lower Aillik Group, a sequence of mafic volcanic rocks and associated sediments. The mafic volcanic rocks are interpreted as having been deposited in a deepening basinal environment. The overlying Upper Aillik Group comprises felsic volcanic rocks and volcanoclastic sediments interpreted as formed under shallow marine to subaerial conditions.

The Aillik Group was intruded by ca. 1750 Ma. synkinematic granitoid rocks, ca. 1600 Ma. postkinematic granites, and ca. 1620 Ma. Adlavik intrusive suite (layered gabbro-diorite). Ferrosyenite emplacement postdates the 1600 Ma. granites and the southern part of the area was intruded by ca. 1450 Ma. Michael Gabbro. Later mafic intrusive activity occurred at 1000-900 Ma. and ca. 150 Ma.

Uranium mineralization is associated with metasedimentary rocks in the Lower Aillik Group and uranium-molybdenite mineralization with felsic volcanic rocks of the Upper Aillik Group. A model, involving meteoric water circulation, is proposed to explain the mineralization.

80. NUNN, G.A.G., Newfoundland Dept. Mines and Energy:
Geology of the Atikonak River area, Grenville Province, western Labrador, 1982-84.

See:
Geol. Surv. Can., Paper 83-1A, p. 363-370, 1983.

Mapping of 23 H/1, 2, 7, and 8 is completed. The main lithology in the region is a unit of paragneiss of probable Aphebian age and apparently correlative with rocks of the Labrador Trough. They have been intruded by a granitoid plutonic suite and various gabbros. The granitoid suite is tentatively correlated with the Paleohelikian North Pole Brook intrusive Suite (ca. 1630 Ma.) and the gabbros are a part of the Shabogamo Intrusive Suite (1380 Ma.). All these rocks have been deformed and metamorphosed to amphibolite to granulite facies during the Grenville Orogeny. Paragneiss inclusions in some granitoid rocks indicate that the sediments were first deformed in the Hudsonian Orogeny.

Further work will be undertaken on these rock types in the coming summer in map-areas 23 A/9, 10, 15 and 16. The nature of the upper amphibolite-granulite facies boundary will be studied and it is planned to date the granitoid suite and an anorthosite body in the south of the area.

81. RYAN, A.B., Newfoundland Dept. Mines and Energy:
The Archean-Proterozoic boundary in the Saglek Fiord area, Labrador, 1982-84.

See:
Geol. Surv. Can., Paper 83-1A, p. 297-304, 1983.

Involves geological mapping and economic mineral evaluation of the Nain Province – Churchill Province boundary, with particular emphasis on establishing the effects of the Hudsonian Orogeny on the Aphebian Ramah Group. The area is covered by NTS 1:50 000 sheets 14 L 2, 3, 4, 5, 6 and 7, of which 6 and 7 were investigated during the 1982 season.

82. THOMAS, A., WARDLE, R.J., DALLMEYER, R.D., Newfoundland Dept. Mines and Energy:
Geology of the Winokapau Lake area, Grenville Province, Labrador, 1982-84.

Mapping during 1982 field season covered 4, 1:100 000 sheets of 13 E/SW. During 1983 season area will be extended to cover 13 D/NW with the aim of elucidating origin and age of amphibolite to granulite grade ortho- and paragneisses. Also, study of metamorphic and tectonic effects on gneisses of reworking during Grenvillian Orogeny. This work is an extension of mapping carried out northeast of the area.

NORTHWEST TERRITORIES/ TERRITOIRES DU NORD-OUEST

83. BOSTOCK, H.H., Geol. Surv. Can.:
Geology of Fort Smith, District of Mackenzie, 1980-.

84. BOSTOCK, H.H., Geol. Surv. Can.:
Geology of the Hill Island Lake area, District of Mackenzie, 1982-.

85. CAMPBELL, F.H.A., Geol. Surv. Can.:
Geology of the Bathurst Inlet area, District of Mackenzie, 1974-.

86. CIESIELSKI, A., Geol. Surv. Can.:
Gneissic basement to the Fury and Hecla Formation and the Autridge Formation on Baffin Island, District of Franklin, 1979-.

Sees:
Description et notes sur la pétrologie des granites de la région du détroit de Fury et Hecla, nord-ouest de l'île Baffin; Geol. Surv. Can., Paper 83-1A, p. 89-101, 1983.

87. FRASER, J.A., Geol. Surv. Can.:
Geology of Woodburn Lake map area, District of Keewatin, 1980-.

88. FRISCH, T., Geol. Surv. Can.:
Precambrian geology of southeast Ellesmere, Devon and Coburg islands, District of Franklin, 1976-.

Sees:
Stratigraphy of the Proterozoic Thule Group, southeastern Ellesmere Island, Arctic Archipelago; Geol. Surv. Can., Paper 81-19, 1982.

Reconnaissance geology of the Precambrian Shield of Ellesmere, Devon and Cobourg islands, Arctic Archipelago; a preliminary account; Geol. Surv. Can., Paper 82-10, 1983.

89. FRISCH, T., Geol. Surv. Can.:
Geology of Montresor River and lower Hayes River map areas, District of Keewatin, 1982-.

Sees:
Preliminary account of the geology of the Montresor River area, District of Keewatin; Geol. Surv. Can., Paper 83-1A, p. 103-108, 1983.

90. FRITH, R.A., Geol. Surv. Can.:
Geology of Indin Lake (86 B) map-area, District of Mackenzie, 1972-.

91. FRITH, R.A., Geol. Surv. Can.:
Geology of Nose Lake and Beechey Lake, District of Mackenzie, 1975-.

92. FRITH, R.A., Geol. Surv. Can.:
Geology of Beechey-Duggan Lakes area, District of Mackenzie, 1980-.

93. GORDEY, S.P., Geol. Surv. Can.:
Geology of Nahanni map-area, Yukon and Northwest Territories, 1979-.

Sees:
Devono-Mississippian (Earn Group) and younger strata in east-central Yukon; Geol. Surv. Can., Paper 82-1B, p. 93-100, 1982.

94. GORDEY, S.P., Geol. Surv. Can.:
Geology of Sheldon Lake (105 J) and Tay River (105 K) map area, east-central Yukon, 1982-.

Sees:
Thrust faults in the Anvil Range and a new look at the Anvil Range Group, south-central Yukon Territory; Geol. Surv. Can., Paper 83-1A, p. 225-227, 1983.

95. HENDERSON, J.B., Geol. Surv. Can.:
Healey Lake map-area, District of Mackenzie, 1978-.

96. JACKSON, G.D., Geol. Surv. Can.:
Operation Bylot, District of Franklin, 1967-.

97. JACKSON, G.D., Geol. Surv. Can.:
Operation Penny Highlands, District of Franklin, 1969-.

98. Le CHEMINANT, A.N., Geol. Surv. Can.:
Macquoid Lake (W 1/2), Thirty Mile and Tebesjuak Lake map-areas, District of Keewatin, 1978-.

99. LeCHEMINANT, A.N., Geol. Surv. Can.:
Geology of Aberdeen Lake and parts of adjoining map areas, District of Keewatin, 1982-.

Sees:
Geology of Aberdeen Lake map area, District of Keewatin: preliminary report; Geol. Surv. Can., Paper 83-1A, p. 437-448, 1983.

100. PUGH, D.C., Geol. Surv. Can.:
Subsurface geology of Great Bear River map-area, District of Mackenzie, 1980-.

101. SCHAU, M., Geol. Surv. Can.:
Geology of the Baker Lake map-area, District of Keewatin, 1980-.

Sees:
Two sapphirine localities in the Kramanituar complex, Baker Lake region, District of Keewatin; Geol. Surv. Can., Paper 82-1C, p. 99-102, 1982.

Updated Rb-Sr ages from the Ingilik Point Gneiss Complex, Baker Lake region, District of Keewatin; ibid., p. 169-171, 1982.

Trace element contents of till and gossanous mud in the Baker Lake region, District of Keewatin; Geol. Surv. Can., Paper 83-1A, p. 37-41, 1983.

102. TELLA, S., Geol. Surv. Can.:
Kamikkuak Lake map-area, District of Keewatin, 1979-.

103. TELLA, S., Geol. Surv. Can.:
Deep Rose Lake and parts of adjoining map areas, District of Keewatin, 1982-.

Sees:
Geology of the Deep Rose Lake map area, District of Keewatin; Geol. Surv. Can., Paper 83-1A, p. 403-409, 1983.

104. TRETTIN, H.P., Geol. Surv. Can.:
Completion of reconnaissance geology, northern Ellesmere Island, District of Franklin, 1973-.

ONTARIO/ONTARIO

105. BEAKHOUSE, G.P., Ontario Geol. Surv.:
Geology of the Grenville Lake area, District of Thunder Bay, Ontario, 1982-84.

Sees:
Kirby, Fulford and McQuesten townships area, District of Thunder Bay; Ontario Geol. Surv., Misc. Paper 106, p. 26-27, 1982.

The Grenville Lake area is situated on the north flank of the Beardmore-Geraldton greenstone belt. The greenstone belt lithologies can be broadly grouped into four major stratigraphic units, namely: a northern metavolcanic belt with predominant, amphibolitic mafic volcanic rocks and ironstone, a northern metasedimentary belt with turbiditic metagreywacke and ironstone, a southern metavolcanic belt with predominant, variously altered mafic volcanic rocks and subordinate felsic volcanic rocks and a southern metasedimentary unit with polymictic conglomerate and arkose. The northern metasedimentary unit and southern metavolcanic unit are in fault contact and it is probable that the present juxtaposition of similar metasedimentary and metavolcanic units in the Beardmore-Geraldton belt is a tectonic, rather than a primary stratigraphic, relationship. The northern one-third of the map area is underlain by a wide variety of pre-, syn- and post-tectonic granitic rocks. Inclusion of probable mafic volcanic parentage define a continuation of the northern metavolcanic belt into the granitoid terrain.

106. CARD, K.D., Geol. Surv. Can.:
Regional geological synthesis, central Superior Province, Ontario and Québec, 1977-.

Sees:
Regional geological synthesis, central Superior Province: reconnaissance investigations in the Nakina area, Ontario; Geol. Surv. Can., Paper 83-1A, p. 25-27, 1983.

107. GRUNSKY, E.C., Ontario Geol. Surv.:
Batchawana synoptic project, Ontario, 1981-83.

Sees:
Ontario Geol. Surv., Misc. Paper 106, p. 36-40, 1982.

108. HUGGINS, R.B., JANES, D.A., Ontario Geol. Surv.:
South Minnitaki Lake area, Patricia mining division, Ontario, 1982-83.

To complete areal mapping (1/4 mile scale) on the southern contact of the Wabigoon subprovince from the southeast bay of Minnitaki Lake to Sandy Beach Lake in the northwest and to study relationships between the southern volcanic belt and the granite batholith. Structural and metallogenic aspects were studied.

109. VERSCHUREN, C., KINGSTON, P.W., Ontario Geol. Surv.:
Metallogeny of volcanogenic sulphide deposits of the Madoc area, eastern Ontario, 1981-84.

Massive pyrite mineralization occurs as conformable lenses within rusty schist zones which are enclosed by metavolcanic rocks of intermediate compositions. Locally associated with these lenses are high grade base and precious metal zones. Aim is to determine the metallogenic relationships and to determine the lithologies of the metavolcanic map units and the related metasediments.

110. VERSCHUREN, C., KINGSTON, P.W., Ontario Geol. Surv.:
The structural and stratigraphic setting of the industrial mineral deposits of the Claire River Syncline, eastern Ontario, 1982-84.

A detailed mapping and petrologic examination is being carried out of the Claire River Syncline in order to quantify the following industrial mineral resources – fine grained muscovite, garnet, calcium carbonate, and sulphur.

QUÉBEC

111. CIESIELSKI, A., Geol. Surv. Can.:
Metamorphism and structure in northeast Superior Province, Québec, 1980-.

112. PETRYK, A.A., Québec Ministère Énergie et Ressources:
Geology, mineral and hydrocarbon exploration of Anticosti Basins basin analysis, 1975-.

Sees:
Aulacerid ecostratigraphy of Anticosti Island, and its bearing on the Ordovician-Silurian boundary and the Upper Ordovician glacial episode; Third North American Paleontol. Convention, Proc. vol. 2, p. 393-399, 1982.

An interdisciplinary synthesis of the lithostratigraphy, sedimentary and aulacerid (sponges/stromatoporoids). Distributions and paleoecology of the Anticosti Island platform sequence demonstrates that 1) it can be divided generally into a western carbonate and an eastern transitional carbonate-siliciclastic-platform facies, 2) sedimentation was continuous from Ordovician to Silurian time, 3) the Ordovician-Silurian boundary (O/S) occurs between a regressive Upper Ordovician and an initially rapid transgressive Lower Silurian megacycle of sedimentation, 4) aulacerids evolved rapidly during the Upper Ordovician and became extinct at or near to the O/S boundary, and 5) the uppermost Ordovician faunal extinctions in member 7 of the Ellis Bay Formation are related to the Late Ordovician glacial episode.

Progress was made on detailed fossil collecting during the Anticosti, (IUGS) Ordovician-Silurian Boundary Working Group June, 1982 meeting at the proposed O/S stratotype on the Island.

SASKATCHEWAN/SASKATCHEWAN

113. GILBOY, C.F., MACDONALD, R., Saskatchewan Geol. Surv.:
Sub-Athabasca basement geology project, Saskatchewan, 1981–84.

Sees
Saskatchewan Geol. Surv., Misc. Rept. 82-4, p. 12-13, 1983.

During 1982, preliminary geological maps of basement rocks underlying the virtually unmetamorphosed clastic sediments of the Paleohelikian Athabasca Group were compiled for NTS 74 H (Geikie River) and 74 G (Cree Lake), 1:250 000 scale. Maps for other areas around the rim of the Athabasca Basin are expected to be completed during 1983.

114. MACDONALD, R., THOMAS, M.W., Saskatchewan Geol. Surv.:
Compilation bedrock geology, Reindeer Lake North area (NTS 64 E), Saskatchewan, 1980–83.

Sees
Saskatchewan Geol. Surv., Misc. Rept. 82-4, 1983.

Preliminary map published at 1:250 000 scale (monochrome). A final full colour map is expected to be published in 1983.

115. THOMAS, M.W., MACDONALD, R., SCOTT, B.P., Saskatchewan Geol. Surv.:
Compilation bedrock geology – Wollaston Lake area (NTS 64 L), Saskatchewan, 1980–83.

Sees
Saskatchewan Geol. Surv., Misc. Rept. 82-4, 1983.

Preliminary map published at 1:250 000 scale (monochrome). A final full colour map is expected to be published in 1983.

ENVIRONMENTAL GEOSCIENCE/SCIENCES DE LA TERRE APPLIQUÉES A L'ENVIRONNEMENT

116. ANDERSON, J.C., BIGRAS, S.C., Environment Canada (National Hydrology Res. Instit.):
Hydrologic studies, Mackenzie Delta region, Northwest Territories, 1975-.

Field studies continued in the eastern Mackenzie Delta region in 1982 at three basins in the taiga zone south of Inuvik and six basins in the tundra zone between Inuvik and Tuktoyaktuk. Data were collected on one or more of the following variables: culvert ice accumulation thickness, late winter snowpack water equivalent, field season precipitation, air temperature, and discharge.

Water Survey of Canada personnel, who have been collecting discharge data at three of the tundra basins and one taiga basin, became more involved in 1981 by assuming responsibility for the Boot Creek gauge.

A survey of culvert icings was conducted in the taiga zone on May 9, 1982, and accumulations were found to be above normal in intensity. Snow surveys were done in the taiga and tundra on May 9 and May 24, respectively. Prior to commencement of snowmelt runoff, precipitation, air temperature and water level recorders were installed at selected sites in early May. Monitoring of these variables continued until September 4, while Water Survey continued to record levels at five sites into the freeze-up period.

A report on the 1981 field season is near completion and analysis of 1982 data will commence thereafter. As data records lengthen more meaningful statistical analysis (such as flood frequency analysis) can be undertaken.

117. ARAFAT, N.M., GLUOSCHENKO, W.A., Environment Canada (Aquatic Ecology Div.):
Long-range transport of metals from smelting operations in northwestern Quebec, 1982-83.

Follow up will be continued for the new project with regard to data interpretation for 83-84.

118. BIGRAS, S.C., ANDERSON, J.C., TERROUX, A.C.D., Environment Canada (National Hydrology Res. Instit.):
Lake regimes, Mackenzie Delta, Northwest Territories, 1980–83.

In 1980 the Delta lake study was initiated to develop an understanding of the hydrology of an extensive variety of lake environments. The knowledge gained through this study will assist in determining the hydrological regimes of these lakes under current Mackenzie River flow conditions.

Through the use of 16 mm time lapse photography, NHRI has been monitoring water levels at two areas, area 3 – 68°43'N: 134°19'W and area 2 – 67°36'N:134°07'W (each area consists of a channel site, a connected lake site and an unconnected lake site) in the eastern sector of the Mackenzie Delta from April to September, 1982. Along with the hydrological data, climatological data (precipitation, air/water temperatures, wind direction and velocity) were collected at NHRI's two Delta study areas.

As part of the 1982 field season an investigation of water quality characteristics was initiated in ten study areas throughout the Delta. Ice core/water samples from a variety of lakes and channels were taken prior to (April-May) and after break-up (June), and at low water levels in September. This information should provide some indication of the effect spring flooding has on the lake system.

In September, 1982, another three water level monitoring sites in area 4 – 68°19'N:134°33'W (consisting of a channel site, a connected lake site and an unconnected lake site) were established just southwest of Inuvik. This brings the total number of NHRI water level monitoring sites operating in the Mackenzie Delta to nine for the Spring of 1983.

This baseline data on water levels, water quality and meteorological conditions, collected at channel and lake sites throughout the Delta, is a prerequisite to identification and evaluation of environmental impacts that could result from flow regulation within the Mackenzie Delta.

119. DUBOIS, J.M.M., Univ. Sherbrooke (Géographie):
Carte des mers postglaciaires du Canada: section de la Côte Nord du Saint-Laurent et d'Anticosti, Québec, 1980–84.

120. DUBOIS, J.M.M., Univ. Sherbrooke (Géographie):
Carte du Quaternaire du Québec, 1981–87.

121. DUBOIS, J.M.M., GWYN, Q.H.J., DESMARAIS, G., CLAVET, D., Univ. Sherbrooke (Geographie), SOQUIP:
Géomorphologie côtière, sensibilité des côtes et sensibilité sismique pour l'étude des répercussions environnementales des forages hauturiers d'exploration dans le golfe du Saint-Laurent, 1982.

Etude préliminaire d'impact des déversements accidentels de produits pétroliers dans le golfe du Saint-Laurent.

122. EGGINTON, P.A., Geol. Surv. Can.:
Periglacial processes and slope movement, central District of Keewatin, 1977-.

Sees
Density gradients and injection structure on mudboils in central District of Keewatin; Geol. Surv. Can., Paper 82-1B, p. 173-176, 1982.

123. EGGINTON, P.A., Geol. Surv. Can.:
Relationship of flood frequency and heavy metal uptake in growth rings of trees. 1981-.

Sees
One aspect of the drainage problem in biogeochemical prospecting; Geol. Surv. Can., Paper 83-1A, p. 343-346, 1983.

Biogeochemical expression of a classic dispersal train of metalliferous till near Hopetown, Ontario; Can. J. Earth Sci., vol. 19, no. 12, p. 2297-2303, 1982.

124. FORTESCUE, J.A.C., DICKMAN, M., TERASMAE, J., Ontario Geol. Surv., Brock Univ. (Geological Sciences):
Multidisciplinary follow-up of regional pH patterns in lakes north of Lake Superior, 1980–83.

Sees
Verification and standardization of methods for the collection of mineral exploration/environmental information from lakes in the vicinity of Wawa, District of Algoma; Ontario Geol. Surv., Misc. Paper 106, p. 162-164, 1982.

Research in the Wawa area on acidic precipitation is continuing and now includes some 50 lakes where lake sediment cores have been subjected to limnological, palynological, and geochemical analysis. The objective is focused on developing sampling, analysis, and interpretation techniques which can be applied to regional geochemical surveying projects in the future so as to maximize the utility of geochemical surveys for environmental as well as mineral potential evaluation.

125. GWYN, Q.H.J., BIGRAS, P., HÉBERT, A., Univ. Sherbrooke (Géographie), U.S. Forest Service:
Les avalanches au Mont Washington, New Hampshire, U.S.A., 1981-83.

Prédiction des avalanches.

126. JACKSON, L.E., Jr., Geol. Surv. Can.:
Environment assessment of coal resources development, Canadian Cordillera, 1977-.

See:
A summary of water chemistry data for undisturbed coal-bearing watersheds and a synoptic survey of open pit mine leachates, southern Rocky Mountains, Alberta and British Columbia; Geol. Surv. Can., Paper 82-1B, p. 239-251, 1982.

127. JACKSON, L.E., Jr., Geol. Surv. Can.:
Debris flow hazard assessment methodology, alpine and northern upland areas, 1978-.

See:
Paraglacial origin for terraced river sediments in Bow Valley, Alberta; Can. J. Earth Sci., vol. 19, no. 12, p. 2219-2231, 1982.

128. KAMENKA, L.A., RUTTER, N.W., Univ. Alberta (Geology):
Rates of weathering of spoil piles from open pit mines in the Rocky Mountains of Alberta from field observation and a laboratory experimental system, 1978-83; M.Sc. thesis (Kamenka).

129. KING, R.H., Univ. Western Ontario (Geography):
Archaeological pedology of southwestern Cyprus, 1982-83.

See:
Canadian Palaipaphos survey project; Brit. Arch. Rep. Intit. Series 155, p. 323-327, 1983.

Soils and archaeological surveys: case of the Canadian Palaipaphos survey project; ibid., p. 101-107, 1983.

Following a preliminary soil survey of the Ezousas, Xeropotamos and Dhiarizas river valleys in southwestern Cyprus in 1980 this project is developing a regional synthesis of the present-day physical environment, together with an assessment of the potential of the area for agricultural production, through an analysis of the physical, mineralogical and chemical properties of the soils. In addition, an estimate of the region's present carrying capacity is being provided through an investigation of soil fertility, soil moisture availability, agricultural management practices, crop yields and agricultural subsistence requirements. This research is in support of a regional archaeological survey of the same area.

130. KING, R.H., BOWYER-BEAUDOIN, A., Univ. Western Ontario (Geography):
Holocene environmental change in Jasper National Park, Alberta, 1977-83; Ph.D. thesis (Bowyer-Beaudoin).

See:
A numerical approach toward the classification of magnetites from tephra in southern Alberta; Can. J. Earth Sci., vol. 19, no. 10, p. 2012-2019, 1982.

Pedologic and palynologic techniques are being used to examine the record of paleoenvironmental changes preserved in the surficial mineral and organic deposits in the vicinity of Sunwapta Pass (52°13'N, 117°13'W). A radiocarbon date of 9,600 B.P. on basal deposits in a peat bog in Wilcox Pass (52°15'N, 117°13'W) at an altitude of 2352 m suggests ice-free conditions at that time. Palynologic evidence from bog cores in Wilcox Pass has been used to reconstruct the sequence of Holocene vegetational changes of regional significance, whereas the pollen record in bog cores from the valley-floor of Sunwapta Pass suggest that the vegetation here is responding to essentially local changes in the hydrology of a series of interconnected basins. Tephrochronology, based on the positive identification of Mazama ash (6,600 B.P.), St. Helens Yn ash (3,900 B.P.) and Bridge River ash (c. 2,000 B.P.), has provided a time-stratigraphic framework for both vegetational changes and episodic soil development, and the physical, chemical and mineralogical properties of surface soils have been related to Holocene paleoenvironmental changes.

131. LAURIOL, B.M.E., Univ. Ottawa (Géographie):
La couverture neigeuse de l'Ungava, Québec, 1980-83.

Le but de l'étude est de cartographier au moyen d'images LANDSAT, NOAA et de photographies aériennes l'évolution de la neige en Ungava au cours des dernières décennies. Cette cartographie est presque terminée. Nous envisageons de la prolonger dans les Îles de Partique. Elle permet de saisir les région les plus susceptibles à connaître un englacement en cas de refroidissement, et elle permet d'apporter des données utiles pour l'interprétation du pergélisol.

132. LEVERTON, D.R., JOHNSON, P.G., Univ. Ottawa (Geography):
The effects of placer mining on invertebrate populations, 1982-83.

To examine the Jarvis River system which has only recently been exposed to placer mining activity; to identify the resident and migrating fish populations utilizing the drainage system; to monitor the degree of sedimentation, general water quality and flow regimes of both stressed and control sites; and to determine the available zoobenthos fauna and its present level of utilization by resident fish species, under both stressed and natural and stressed conditions and the corresponding implications for resident and anadromous fish fauna.

To examine a series of river/creek systems which have been subjected to serious environmental perturbations as a result of placer activity; and to study both high and low volume operations and the degree of variance regarding water quality, flow characteristics and zoobenthic diversity under both stressed and natural conditions.

133. MUDROCH, A., ZEMAN, A.J., KALAS, L.L., Environment Canada (National Water Res. Instit.):
Concentration of calcium carbonate in postglacial lacustrine sediment, 1981-82.

See:
Calcium carbonate in Postglacial Lake Erie sediment; J. Great Lakes Res., vol. 8, no. 4, p. 711-718, 1982.

Two zones of carbonate-rich, fine-grained sediments are documented by a detailed investigation of a 16.8-long core collected from the central Lake Erie basin. Geotechnical properties, geochemistry, mineralogy, chemical composition of individual particles, and biostratigraphy were investigated. The shells of mollusc species found in the core indicate that the carbonate-rich sediments were deposited in warmer water than the carbonate-deficient sediments above and between them.

134. PROWSE, T.D., ANDERSON, J.C., Environment Canada (National Hydrology Res. Instit.):
River ice jams, Mackenzie River Basin, Northwest Territories, 1982-.

Observations of break-up on the Liard and Mackenzie Rivers near Fort Simpson, Northwest Territories were made during May 1982. The timing and characteristics of break-up were recorded using 35 mm oblique aerial photography, ice thickness was obtained from pans stranded along the shore, surface water temperatures were monitored, and water levels were observed. A report detailing the results of this work has been prepared and submitted.

In the fall of 1982 freeze-up was monitored from light aircraft along portions of the Liard River and on the Mackenzie River from Fort Providence to the Mackenzie Delta. Field reconnaissance was also made of potential jam sites, especially in the region near Fort Simpson, Northwest Territories.

A number of techniques for measuring ice jam characteristics and processes are being devised and appropriate equipment assembled for the 1983 spring field study. In particular, a 35 mm aerial camera system, which will allow inexpensive, repetitive photography of ice jam sites, is currently under construction. A 'false parallax' technique of photo interpretation is also being refined in order to measure river velocities during break-up.

Other techniques/equipment under review, focus on the measurement of ice jam water levels, ice thickness and the energy balance leading to the deterioration of river ice prior to break-up.

135. RUKAVINA, N.A., Environment Canada (National Water Res. Instit.):
Nearshore sediment data reports/atlas, 1978-84.

See:
Lake Huron nearshore sediment data, Sarnia to Harris Point; NWRI Hydraulics Div., Tech. Note 82-16, 1982.

Lake Ontario nearshore sediment data, Long Branch to Whitby, Oakville to Long Branch; NWRI Hydraulics Div., Tech. Notes 82-23, 82-25, 1982.

Nearshore acoustic and subsurface geologic data, Pointe-aux Pins, Lake Erie; NWRI Hydraulics Div. , Tech. Note 83-01, 1983.

Resource potential of Lake Ontario nearshore deposits; Proc. 3rd Workshop on Great Lakes Coastal Erosion and Sedimentation, Burlington, Ontario, November 1982.

The study objective is to complete the organization and publication of field and laboratory data for Great Lakes nearshore sediments as a Coastal Sediment Atlas and Data Report Series.

136. RUKAVINA, N.A., Environment Canada (National Water Res. Instit.):
Third workshop on Great Lakes coastal erosion and sedimentation, 1982-83.

137. SHILTS, W.W., Geol. Surv. Can.:
Sensitivity of surficial sediments to effects of acid precipitation, 1980-.

See:
Subbottom profiling of Canadian Shield lakes – implications for interpreting effects of acid rain; Geol. Surv. Can., Paper 82-1B, p. 209-221, 1982.

138. ZEMAN, A.J., Environment Canada (National Water Res. Instit.):
Geotechnical studies of eroding bluffs, 1973-84.

Monitoring of two slope-indicator casings installed at the Port Burwell site has been terminated. No evidence of progressive subsurface displacements prior to bluff failures has been obtained. Long-term monitoring of pore pressures has continued throughout the period. Data analysis is underway. Progress has been made in slope stability analyses applied to measured profiles from the study site.

139. ZEMAN, A.J., Environment Canada (National Water Res. Instit.):
Laboratory test of soil erodibility, 1981-.

Sees
Erosion resistance of cohesive sediments; Proc. 3rd Workshop on Great Lakes Coastal Erosion and Sedimentation, NWRI, Burlington, Ontario, November 1982.

The design of a more accurate rotating-cylinder apparatus was completed in 1982. Calibration and trial tests with undisturbed till samples are in progress. The effect of surface roughness on the torque measured in the apparatus has been investigated. Initial tests with samples of cohesive till are encouraging. Measurements of critical shear stresses that have been obtained are quite consistent and comparable to those reported for compacted samples in the literature. The first draft of Bibliography and Annotated Abstracts concerned with the erosion resistance of cohesive sediments has been completed.

ANALYTICAL METHODS AND ANALYSIS/ MÉTHODES ANALYTIQUES ET ANALYSES

140. ABBEY, S., Geol. Surv. Can.:
Analysis of international reference samples, 1969-.

141. ENGI, M., Univ. British Columbia (Geological Sciences):
Probe analysis of fine-grained and inclusion-contaminated solids, 1977-82.

Sees
A correlation procedure for the effects of inclusions on electron probe microanalysis of fine-grained materials; Computers and Geosciences, vol. 8, no. 3, 1982.

142. HIGGINS, M.D., SHAW, D.M., McMaster Univ. (Geology):
Boron abundance in the mantle and the bulk boron content of the Earth, 1981-83.

We have measured the abundance of boron in fresh spinel lherzolites using prompt-gamma neutron activation. Six samples considered to represent fresh uncontaminated fertile mantle by Jagoutz et al. (1979) yield a mean value of one ppm. If this value is taken as representative of the whole mantle and if the core is boron-free, then the bulk boron composition of the earth is 0.7 ppm. This value is similar to that obtained using meteoritic abundance data (Ganapathy and Anders, 1976). The boron abundance in the earth obtained is this study is 40% of the cosmic abundance relative to silicon (Anders and Ebihara, 1982). This depletion is consistent with nebular condensation models in which boron is a moderately volatile element (Cameron et al., 1973). Spinel lherzolites slightly depleted in major elements have much lower boron contents (<0.3 ppm, mode 0.1 ppm) than fertile material, suggesting that small degrees of partial melting can easily remove boron from the mantle. Conversely amphibole-bearing lherzolites, commonly believed to have been metasomatized in the mantle, are enriched in boron (up to 5 ppm).

We hope to extend our measurements to study the mineralogical location of boron in mantle rocks.

143. JANKE, L.C.G., EMR (CANMET):
Trace elements in coal: an initial report, 1982-83.

Start of work on profiling Canadian commercial coals in terms of trace elements.

GEOCHEMISTRY/GÉOCHIMIE

An Inductively Coupled Plasma (ICP) analyser is being utilized and evaluated, using ASTM reference coals for intial trials.

144. LACHANCE, G.R., Geol. Surv. Can.:
Development of methods for the analysis of geological materials, 1969-.

145. SEIGEL, H.O., ROBBINS, J.C., Scintrex Ltd., Ontario Geol. Surv.:
Tin-Tungsten determinations in-field, 1981-82.

Development and in-field testing of analytical instrumentation for field determinations of tin and tungsten in various geological materials.

146. STEGER, H.F., BOWMAN, W.S., SABOURIN, R.G., EMR (CANMET):
Canadian certified reference materials project (CCRMP), 1970-.

Sees
BL-2a and BL-4a: Certified uranium reference ores; CANMET Report 82-6E, 1982.

MP-1a: A certified reference ore; CANMET Report 82-14E, 1982.

MW-1: A certified iron reference ore; CANMET Report 82-16E, 1982.

The rejection of RU-1 due to ambient oxidation; Geostandards Newsletter, vol. 6, no. 2, p. 209, 1982.

In this period, the certification program for iron ore MW-1 was closed and this material will be available for sale in early 1983. Certification programs for a tungsten-molybdenum ore, MP-2, and a tantalum ore, TAN-1, were begun and are scheduled for closing in March 1983. A gold tailings reference material was prepared. Also four uranium tailings samples were prepared for the National Uranium Tailings Research Program for use as quality control materials and possibly also for issuance as certified reference materials.

EXPLORATION, ORGANIC/ APPLIQUÉE, ORGANIQUE

147. BARNES, W.C., BARNES, M.A., Univ. British Columbia (Geological Sciences):
Diagenesis of diterpene acids from resins of *Pinus contorta* stumps embedded in middle Holocene peats under freshwater and brackish reducing conditions, 1982-84.

Recent peats, approximately 4000 years old, are well developed in the eastern part of Lulu Island on the Fraser River delta. These peats contain abundant stumps of the shore pine, *Pinus contorta*. Stumps exposed along the main arm of the Fraser River, and present but not exposed near the river, are embedded in peats which are involved in the active reduction of sulphate brought into the estuary during high tides. Stumps at a distance from the estuary are exposed to freshwater diagenesis only, and lack the abundant sulphide found in the peats nearer the river. Microscopic study of microtome sections of the stumps has shown that resins in the stumps nearer the river have a much darker colour than those of stumps away from the river. To distinguish the effects of the sulphate reduction ecosystem on the diagenesis of resin acids derived from conifers, particularly on the processes of decarboxylation, demethylation and progressive aromatization leading to the formation of alkylated polynuclear aromatic hydrocarbons.

148. BERTRAND, R., INRS-Géoressources:
Maturation thermique, potentiel pétroligène et histoire de la catagénèse des roches post-taconiques de la Gaspésie et de l'Île Anticosti, Québec, 1982-83.

Voir:
Recristallisation des calcaires micritiques en fonction de la maturation thermique dans les Basses-Terres du Saint-Laurent du Québec; J. Can. des Sciences de la Terre, vol. 20, no. 1, p. 66-83, 1983.

Calibration d'indicateur de maturation thermique, histoire de la catagénèse et potentiel pétrolipène des bassins Ordoviciens à Dévoniens de la Gaspésie et de l'Île d'Anticosti. Rapport à un organisme provincial achevé, rapport à un organisme privé en cours, analyses complémentaires en cours.

149. JONASSON, I.R., Geol. Surv. Can.:
Environmental geochemistry, 1974-.

Sees
Chemical forms of copper in fallen snow; Geol. Surv. Can., Paper 82-1C, p. 103, 1982.

150. KOVAC, L.J., LAST, W.M., Univ. Manitoba (Earth Sciences):
Sedimentology and organic geochemistry of selected cores through the organic-rich Cretaceous interval in Manitoba, 1982-83; M.Sc. thesis (Kovac).

During the past eight months research on the "Oil Shales of Manitoba" project has progressed in three main areas: 1) core examination and description. This included detailed examination, photography lithologic description, and logging of all available subsurface core intersecting the Boyne, Morden, Favel, and/or Ashville units in Manitoba. A total of 235 m of core was logged; 2) mineralogical analysis. One hundred and fifty-one subsamples of core were collected for mineralogical analyses by X-ray diffractometry. This is a sampling density of one sample every 1.5 m. Both bulk mineralogy and semiquantitative clay mineralogy are being examined; and 3) petrographic analysis. Fifty core subsamples (one sample per 4.5 m) were collected for detailed petrographic analyses by thin section and scanning electron microscopy. This detailed analysis has just now begun.

151. LAST, W.M., Univ. Manitoba (Earth Sciences):
Organic geochemistry, sedimentology and resource potential of Manitoba's oil shales, 1981-84.

Although there are numerous "oil-shale" accumulations in Canada, one of the more significant and interesting occurrences is that of the Upper Cretaceous shale in west-central Manitoba. I am examining, on a reconnaissance basis, the mineralogy, sedimentology, organic type, organic maturity, and organic richness of this deposit. The results of this new research will not only advance our knowledge of Manitoba stratigraphy and sedimentology, but will also have direct application to future assessment and exploitation of this resource. In addition, the results will provide the necessary data base for further, more detailed examination of the organic-rich interval.

152. POWELL, T.G., Geol. Surv. Can.:
Hydrocarbon geochemistry of Arctic Archipelago and Canadian East Coast offshore, 1976-.

153. SNOWDON, L.R., Geol. Surv. Can.:
Development of extraction, identification and correlation systems for organic compounds from sedimentary rocks and crude oils, 1973-.

154. SNOWDON, L.R., Geol. Surv. Can.:
Hydrocarbon geochemistry of northern Interior Plains and Beaufort Sea, 1976-.

155. SNOWDON, L.R., Geol. Surv. Can.:
Oil shale resources of Canada, 1982-.

156. WARREN, H.V., HORSKY, S.J., Univ. British Columbia (Geological Sciences):
Biogeochemistry prospecting for gold, silver, 1968-.

157. WARREN, H.V., HORSKY, S.J., Univ. British Columbia (Geological Sciences):
Potential of the Pinchi Fault as a source of new mercury mines, also gold and silver, British Columbia, 1981-83.

158. WARREN, H.V., HORSKY, S.J., ROUSE, G.E., Univ. British Columbia (Geological Sciences):
The use of pollen as a supplementary guide in mineral exploration, 1980-.

This idea has been demonstrated to have great potential.

EXPLORATION, NON-ORGANIC/ APPLIQUÉE, NON-ORGANIQUE

159. BEAUMIER, M., LALONDE, J.-P., Québec Ministère Énergie et Ressources:
Géochimie des sédiments de fond de lac – Région de la Rivière de la Baleine, Québec, 1983-84.

Voir:
Québec Ministère Énergie et Ressources, DP-82-16, 1982.

Il vise à identifier le signal géochimique multi-éléments associé aux intrusions calco-alcalines de la région et à mettre en évidence le potentiel métallifère de celle-ci.

160. BOYLE, D.R., Geol. Surv. Can.:
Regional geochemistry, Newfoundland and Labrador, 1976-.

See:
Geochemical investigations of uranium anomalies in the Archean Hopedale block and Proterozoic Island Harbour Intrusive Complex, Labrador; Geol. Surv. Can., Paper 82-1C, p. 19-29, 1982.

161. CHORNIERE, J., LALONDE, J.-P., Québec Ministère Énergie et Ressources:
Géochimie des sédiments de ruisseau de la portion sud des Appalaches, Québec, 1983-84.

Inventorier la partie sud de la région des Appalaches pour ses possibilités minières.

162. COUTURE, R., DARLING, R., École Polytechnique (Génie minéral), Univ. Montréal (Géologie):
Petrography and geochemistry of the hydrothermal alteration pipe, Anuil Mine, Rouyn-Noranda, Québec, 1982-84; M.Sc.A. thesis (Couture).

163. DAVENPORT, P.H., Newfoundland Dept. Mines and Energy:
Tungsten in organic lake sediment: an indicator of tungsten mineralization in granitoid rocks, 1982-84.

The element suites determined on organic lake sediments collected in regional geochemical surveys do not include W or Sn – two ore elements of economic significance in some granitic terrains. To determine whether W in this sample medium might be useful as a direct indicator of W mineralization in granitoids, about 800 samples from south-central Newfoundland were analysed for this element by colorimetry (using Zn dithiol as indicator) following an HF-$HClO_4$ digestion.

The area from which the samples were selected included the W-Mo mineralization at Granite Lake which was found during the follow-up of a Mo-U-F-Zn-Cu-Ag lake sediment anomaly. The distribution of W in lake sediments corresponds closely to the distribution of the W mineralization in the host granite. In addition, a number of well defined W anomalies are present away from the area of known mineralization, which suggest further exploration targets. Some of these anomalies are polymetallic, with coincident Mo and Pb highs, whereas others are of W alone. If these latter are found to be related to mineralization, then this would demonstrate the limited effectiveness of the pathfinder elements in W exploration, and the importance of determining the ore metal itself.

164. DESJARDINS, M., LAMARCHE, R., INRS-Géoressources:
Micro-analyse de mono-particules d'argiles au Microscope Électronique à Balayage, 1982-83.

Mise au point des techniques de préparation d'échantillons sur supports et grilles pour le M.E.B. Essai de reproduction des micro-analyses sur des échantillons de bentonites. Mise au point du traitement des données par ordinateur.

163. DUNN, C.E., Saskatchewan Geol. Surv.:
Lake-sediment geochemistry, northern Saskatchewan, 1975-84.

Compilation of atlas of lake sediment geochemistry (marginal to the Athabasca Sandstone).

166. DUNN, C.E., Saskatchewan Geol. Surv.:
The application of biogeochemistry to mineral exploration in Saskatchewan, 1979-.

See:
The massive Wollaston uranium biogeochemical anomaly in the boreal forest of northern Saskatchewan, Canada; OECD Nuclear Energy Agency, p. 477-491, 1982.

Determine relationship between mineralization and metal concentrations in various plants.

167. FORTESCUE, J.A.C., LOURIM, J.T., Ontario Geol. Surv.:
Reconnaissance basal till surveys and related geochemical research in Kirkland Lake area, northern Ontario, 1979-83.

See:
Descriptive geochemistry and descriptive mineralogy of basal till in the Kirkland Lake area, District of Timiskaming and Cochrane; Ontario Geol. Surv., Misc. Paper 106, p. 168-170, 1982.

Data obtained over a 3-year period, under the Kirkland Lake regional basal till project, are being computerized with the objective of producing multi-parameter, geochemical-trend maps for displaying down-ice dispersion trains in the lower till units, and combining this information with mineralogical data from the same horizon. Geological information, including regional structure, bedrock lithology, Quaternary geology, and airborne geophysical results, is being used to aid interpretation of the geochemical and mineralogical studies.

168. FOSCOLOS, A.E., Geol. Surv. Can.:
Clay and clay minerals investigation, 1968-.

169. HÉBERT, C., Québec Ministère Énergie et Ressources:
Étude de la carbonatite de Dolomieu, Chibougamau, Québec, 1982-84.

Établir une nouvelle cible régionale pour la recherche des éléments exotiques associés aux carbonatites.

170. HORNBROOK, E.H.W., Geol. Surv. Can.:
National geochemical reconnaissance, 1975-.

171. JONASSON, I.R., Geol. Surv. Can.:
Trace elements in sulphides, 1976-.

172. McCONNELL, J.W., DAVENPORT, P.H., Newfoundland Dept. Mines and Energy:
1) Evaluation of reconnaissance and follow-up geochemical surveys in Labrador, 1978-83. 2) Geochemical exploration methods for granite-hosted tin and tungsten mineralization in Newfoundland, 1982-84.

1) A reconnaissance lake sediment and water survey, was conducted over an area of 136,000 km^2 in Labrador. Analytical and field data were obtained from 8048 samples sites. These data have been summarized as a smaller aggregated data set by establishing for the whole survey area a grid of 1386 cells each 10 km square, and calculating the means of elements and other variables, the standard deviations and the ranges for the individual samples from each cell. Using this aggregated data set, relationships among the various chemical and physical variables are examined and non-geological environmental factors which effect the chemical composition of lake sediment are identified. Dispersion patterns of various elements of interest in base metal exploration are presented as are patterns of elements "corrected" for environmental factors. These patterns are related to bedrock composition and mineralization.

Detailed lake sediment/water surveys were conducted over nine areas within the reconnaissance survey having anomalous base metal concentrations in sediment. Additional surveys of stream sediment, water, soil and rock were conducted in some of these. Many of these data are evaluated in terms of the local bedrock composition mineralization and Pleistocene geology. The effects on dispersion patterns of various environmental factors are also considered at the detailed exploration level. 2) Field work for the project on geochemistry over graphites began in 1982. Samples of soil, till, stream sediment, rock and heavy mineral separates from tills are currently being analyzed. An open file release of data is planned for this year. Field work over additional tungsten anomalies in lake sediment is planned for the summer of 1983.

173. McTAGGART, K.C., KNIGHT, J., Univ. British Columbia (Geological Sciences):
Composition of gold from placer and lode deposits in British Columbia, 1982-83; M.Sc. thesis (Knight).

Placer gold from Fraser River and its tributaries is being analysed by electron microprobe. Gold/Silver ratios and the percentages of up to 13 minor elements are being determined. The compositions of placer gold will be compared with those of gold from known lodes, and thus information on the origin of placer gold, gold transport, glacial dispersion of gold, and changes in composition of gold during travel will be obtained.

174. MAURICE, Y.T., Geol. Surv. Can.:
Regional geochemistry, northern Canadian Shield, 1976-.

See
Recognition of uranium concentration processes in granitoid related rocks using airborne radiometric measurements; Geol. Surv. Can., Paper 83-1A, p. 277-284, 1983.

175. MELLINGER, M., SMITH, J.W.J., Saskatchewan Research Council (Geology):
Lithogeochemistry, Saskatchewan, 1980-.

See
Lithogeochemistry: basic concepts, application to exploration effective data analysis; Sask. Res. Council, Publ. No. G-740-1/2-D-82, 1982.

The lithogeochemistry data files: user manual; ibid., Publ. No. G-740-13-E-82, 1982.

Establish an effective methodology for lithogeochemical exploration. Emphasis on: consistency and pertinence of sampling and analytical data, "exhaustivity" and integration of complementary and lithogeochemical information, flexibility and relevancy of data analysis. Technical aspect: flexible use of different computer configurations (main frame computer and local graphics computer system), flexible data analysis software configuration.

176. NADEAU, A., Québec Ministère Énergie et Ressources:
Evaluation de cibles géochimiques en Abitibi, Québec, 1981-84.

Projet pilote de localisation de cibles d'exploration dans certains secteurs géochimiquement anomaliques afin d'étudier et de proposer des méthodologies permettant de cerner le plus précisément possible ces cibles d'exploration.

177. NIELSEN, E., FEDIKOW, M.A.F., Manitoba Dept. Energy and Mines (Geol. Services Br.):
Overburden sampling in the Lynn Lake area, Manitoba, 1982-84.

Detailed till sampling was undertaken around the Agassiz gold mine to test the feasibility at using overburden specifically till as a medium to low cost geochemical prospecting. Heavy mineral concentrates from samples collected at 95 sites will be analyzed for Cu, Pb, Zn, Ni, Au, As, Sb, and W.

178. NIELSON, E., GALE, G.H., Manitoba Dept. Energy and Mines (Geol. Services Br.):
Mineral deposit studies in Phanerozoic rocks of southern Manitoba, 1981-85.

Basal till samples were collected in the southern Interlake to determine the source of rare float galena pebbles, another of which was discovered in the Swan River area.

Stratigraphic studies in the Interlake has revealed the presence of two widespread tills throughout the area. The upper unit was deposited by ice flowing south-southeast along the axes of the Interlake whereas the underlying till because of its higher Precambrian clast content is believed to have been deposited by ice flowing toward the south or southwest. Geochemical analyses of the till samples are forthcoming.

179. RAY, G.E., British Columbia Ministry Energy, Mines, Petrol. Res. (Geol. Br.):
Nagy gold occurrences-Doctors Point, Harrison Lake project, British Columbia, 1982-84.

The project involves whole rock and trace element analyses together with petrographic studies on the gold-silver mineralization in hornfelsed metavolcanic rocks at Doctors Point, Harrison Lake, British Columbia. An overview of the Harrison Lake fracture system, with its associated hot spring activity and gold occurrences could outline areas of potential epithermal and vein-type gold mineralization.

180. ROGERS, P.J., MACDONALD, M.A., Nova Scotia Dept. Mines and Energy:
Applied geochemical surveys, 1982-84.

To complete geochemical sampling coverage for northern Nova Scotia and Cape Breton Island. Processed results to be published at 1:250 000 scale single element maps; integrating existing and new data to a common base. Coverage for Cape Breton Island was commenced in 1982 and will be completed with the rest of northern Nova Scotia in 1983.

181. ROY, C., DARLING, R., LUDDEN, J.N., BÉLAND, J., École Polytechnique (Génie minéral), Univ. Montréal (Géologie):
Structure and geochemistry of the host rocks at Kiena Gold Mines, Val d'Or, Québec, 1980-83; M.Sc.A. thesis (Roy).

182. SCHRIJVER, K., INRS-Géoressources:
La préparation de résidues insolubles pour les études métallogéniques: répartition des métaux-traces par la méthode d'extraction séquentielle, 1983-84.

183. SCHRIJVER, K., INRS-Géoressources:
Métaux-traces dans les résidus insolubles: apport à l'exploration lithogéochimique et à la métallogénie des gîtes du type de la Vallée du Mississippi, 1983-85.

184. VAN BOSSE, J., CIMON, J., WILLIAMS-JONES, A.A., IREM-MERI (McGill), Québec Ministère Énergie et Ressources:
Altération Monts McGerrigle, Parc de la Gaspésie, Québec, 1983-84; thèses de maîtrise (Van Bosse, Williams-Jones).

Cartographie de l'altération associée aux gîtes de métaux de base et de métaux précieux dans les Appalaches. Identifier des destinations entre l'altération associées aux gîtes et l'altération de contact.

185. WATKINSON, D.H., DILLON-LEITCH, H., McEWEN, J., Carleton Univ. (Geology):
Geochemistry of precious metal concentrations in some Ni-Cu-PGE and Cu-Zn-Ag-Au deposits, 1981-84; Ph.D. thesis (Dillon-Leitch), M.Sc. thesis (McEwen).

Microprobe analysis of about 60 grains of platinum-group minerals from drill hole specimens, Donaldson East, West and Surface Ni-Cu deposits, has revealed that Sudburyite (PdSb) and Testibiopalladinite $Pd(Sb,Bi)Te$ are the commonest PGM, with lesser sperrylite, michenerite, merenskyite and kotulskite, trace hessite, electrum and gold. Fourteen neutron activation and XRF analyses of Donaldson sulfides show a strong correlation of Pd, Pt with Ni. Metamorphic and deformational effects on sulfides are significant in element mobilization.

Mapping and sampling of Mines Gallen (surface) and Archean sulfide-rich interflow sediments (and volcanics) at Vein 63 and Beaver-Temiskaming Mine, Cobalt, is complete. Specimens are prepared for assay and sulfur-isotope studies.

GENERAL/GÉNÉRALITÉS

186. BAADSGAARD, H., Univ. Alberta (Geology):
Isotope geology and geochemistry of the potash beds of the Devonian Prairie Evaporites in Saskatchewan, 1979-.

Have completed extensive chemical and isotopic (Rb-Sr + K-Ca) analyses on a 30 feet portion of the Alwinsal Willowbrook 7-10-25-6W2 well. This portion comprises the Esterhazy formation in the area and has co-existing carnallite and sylvite. The Rb-Sr and K-Ca systematics show opposite behaviour in isochron plots and indicate strong recrystallisation of the potash beds, especially in the Cretaceous. Bromine analyses show re-equilibration of available bromine between the recrystallized minerals, but iodine is present at levels far below sea water content.

187. BALLANTYNE, S.B., Geol. Surv. Can.:
Regional geochemistry-southern Cordillera, 1979-.

188. BARAGAR, W.R.A., Geol. Surv. Can.:
Stratigraphy and geochemistry of the volcanic rocks of the Circum-Ungava Belt, District of Keewatin, 1978-.

189. BEAUDOIN, A., PERRAULT, G., École Polytechnique (Génie minéral):
Géochimie du gîte d'or Dest Or, Québec, 1983-84; thèse de M.Sc.A. (Beaudoin).

Trouver les principaux paramètres géochimiques des gîtes d'Or de la Mine Dest Or.

190. BEAUMIER, M., LALONDE, J.-P., Québec Ministère Énergie et Ressources:
Pédogéochimie de la région de Montauban, Québec, 1982-84.

Il vise à identifier le signal géochimique multi-éléments associé aux minéralisations de la région et à mettre en évidence le potentiel métallifère de celle-ci.

191. BOYLE, R.W., Geol. Surv. Can.:
Geochemistry of metallogenesis and primary halos, 1973-.

192. CAMERON, E.M., Geol. Surv. Can.:
Geochemical provinces, District of Mackenzie and Ontario, 1980-.

193. CROCKET, J.H., PRASAD, M., McMaster Univ. (Geology):
Origin of siliceous interflow sedimentary rocks from Munro Township, Ontario, 1979-83; Ph.D. thesis (Prasad).

A study of siliceous, interflow cherty sedimentary rocks, mafic volcanic rocks and turbiditic greywackes from Munro Township, Ontario. Major elements, a suite of selected trace elements including noble metals and rare earth elements have been determined by XRF and NAA methods.

On the basis of our trace-element data, we consider the non-clastic interflow sediments (cherts, silicified evaporites, and carbonates) to represent exsolved siliceous and gaseous (fluid) fraction separated during the upward migration and extrusion of the associated komatiitic and tholeiitic lavas. As expected of such fluids, these interflow sediments are considerably enriched in incompatible elements like Th, U, Zr, Hf, Nb, LREE >HREE, and ΣREE; whereas associated komatiites and tholeiites are depleted in them (e.g. the LREE depleted pattern of the komatiites.).

The 2.7 billion Archean clastic sediments (turbiditic greywackes and shales) have similar REE abundance pattern to the post-Archean sediments (PAS), except the -ve Eu anomaly of the latter. However, these sediments are enriched in mafic constituents such as , Ni, Cr, V, Co, Sc, Ir, MgO; whereas depleted in elements, such as, Th, Hf, U, Zr, Nb etc.; therefore, indicating a more mafic source and mafic Archean upper continental crust for the Canadian Shield.

194. DUROCHER, M.E., Ontario Geol. Surv.:
Hydrothermal alteration in the vicinity of the Madsen and Starratt-Olsen former gold producers, Red Lake, Ontario, 1981-83.

The area in the vicinity of the former Madsen and Starratt-Olsen Mines was geologically mapped and sampled. Based on results obtained from analysis of 164 samples, the boundary between the lower tholeiitic-komatiitic sequence and the upper calc-alkalic sequence of the Red Lake belt has been shifted one to two km to the south.

Analysis of 167 surface samples indicates an extensive alteration halo, 8 km along strike, centred on and extending above and below the tuff units that occur in the lower parts of the tholeiitic-komatiitic sequence. Alteration consists of significant depletion in Na_2O, low CO_2 and addition of K_2O. Anomalous gold values show direct correlation with As and Sb.

195. DYCK, W., Geol. Surv. Can.:
Disequilibrium in the uranium series, 1978-.

See:
Feasibility tests on the use of a quadrupole mass spectrometer for sulphur isotope determinations; Geol. Surv. Can., Paper 82-1B, p. 291, 292, 1982.

196. EGAN, D.M., LAST, W.M., Univ. Manitoba (Earth Sciences):
Clay mineralogy as a control of brine chemistry in hypersaline lakes of western Canada, 1981-83; M.Sc. thesis (Egan).

Hypersaline Na-Mg-SO_4 Brine-clay Mineral Interactions

Dozens of saline and hypersaline lakes occur in the great plains region of western Canada and the northwestern United States. A study of the sediments occurring in 10 of these lakes indicates a high percentage of clay minerals (25-80% of the sediments). Clay minerals are very sensitive to their environment and by processes such as cation exchange and layer reordering they strive for equilibrium. At the same time and by the same processes they influence the surrounding medium. It has long been known that clay minerals exert a significant influence on the chemical composition of the acqueous environment.

Preliminary observations from this clay mineral-brine interaction study confirm that clay minerals affect the chemical character of the brine. In concentrated (approx. 250 ppt total salts) Na-Mg-SO_4 brines Illite (a potassium alumino-silicate hydroxide) gives up some K in favor of either Na and/or Mg depending on the initial Na/Mg ratio. X-ray diffraction and X-ray fluorescence of the clays, presently underway, will characterize the nature of the cation exchange/replacement. Other interesting preliminary observations include the dramatic reduction in concentration of Mg in brine, of high Mg/Na ratios at high pH.

197. ELLWOOD, D.J., Geol. Surv. Can.:
Geochemical information systems, 1975-.

198. ENGI, M., Univ. British Columbia (Geological Sciences):
Thermodynamic analysis of calorimetric and phase equilibrium data on solid solutions sharing one exchange operator: $FeMg_{-1}$, OHF_{-1}, KNa_{-1}, 1981-83.

Available exchange equilibrium data and direct calorimetric measurements (heat of mixing) are analyzed using linear programming and non-linear optimization methods. The aim is to derive an internally consistent set of thermodynamic solution properties for a large number of rock-forming minerals.

199. ERDMAN, L.R., ARMSTRONG, R.L., Univ. British Columbia (Geological Sciences):
Neutron activation analysis of trace elements for use as discriminants of tectonic setting for basaltic rocks of British Columbia, 1982-84; M.Sc. thesis (Erdman).

To reanalyze previously collected rock suites and analyze 'new' suites of basaltic rocks by neutron activation, to determine the concentrations of trace elements in these rocks. Using discriminant diagrams based on Rare Earth and LIL Elements, and previously analyzed major and minor element concentrations, original tectonic environments of the basalts may be deduced.

200. ERNST, R.E., HALLS, H.C., Univ. Toronto (Geology):
Evidence of lateral magma flow in diabase dykes, 1981-83; Ph.D. thesis (Ernst).

Six cross-sections have been sampled for geochemical, paleomagnetic and flow texture studies along the 500 km length of an ENE trending Abitibi dyke in northeastern Ontario and Quebec whose thickness, D, ranges from 100-200 metres. The project is to test whether there are any systematic longitudinal changes in the nature of the diabase that might indicate the source direction of the magma during dyke emplacement. While the data are still insufficient to draw firm conclusions, the following preliminary results have been obtained from neutron activation and XRF analyses. The concentrations of Zr, Y and the rare earth elements (REE) from chilled margin areas tend to increase by a factor of 2 eastwards along the dike, (Zr:50-100 ppm; Y:10-20 ppm and chondrite normalized REE values – La:80-80 and Lu:5-10). However the Zr/Y ratio for example and the slope of the REE patterns do not change suggesting that the same magma pulse or the same magma type is represented along the entire length of the dyke.

Preliminary paleomagnetic work supports a single pulse model. Data from all cross sections shows a tight grouping lacking any systematic distribution with respect to sampling position. Therefore intrusion occurred over a short enough time interval (no more than a few 100 years) such that secular variation was not recorded.

Profile geochemical cross-sections show a 2 times increase in the concentration of Zr and Y rare earths from the margin to the centre of the dyke. In most profiles the margin is flat and the increase in concentration is sudden beginning at a distance of about D/3 from each margin.

However, the Zr/Y ratio remains nearly constant, consistent with the idea of a single magma pulse. The only field evidence of multiple intrusion has been found at the western end of the dyke. The tentative interpretation of the geochemical data is that the dyke was fed during a single magmatic episode, and that a pulse of magma with a component of easterly lateral flow moved along the dyke. Fractional crystallization of this magma due to cooling along the dyke walls resulted in progressive enrichment of incompatible elements in the magma as it moved eastwards.

201. GODFREY, J.D., GOFF, S.P., Alberta Research Council (Geol. Surv.):
Geochemical-petrological study of the Canadian Shield in northeastern Alberta, 1976-84.

Baseline data prepared for computed data bank. Numerical data to be processed for multivariate statistical and discriminating analysis of major and trace elements.

202. GOODFELLOW, W.D., Geol. Surv. Can.:
Regional geochemistry, Yukon Territory, 1977-.

203. GOODFELLOW, W.D., Geol. Surv. Can.:
Geochemistry of mineral occurrences and their host rocks in the Northern Cordillera, 1979-.

204. HASSAN, H.H., HALE, W.E., BACHINSKI, S.W., BURKE, K.B.S., Univ. New Brunswick (Geology):
Uranium and thorium in rocks of southwestern New Brunswick, 1979-83; Ph.D. thesis (Hassan).

205. JOHNSON, W.M., British Columbia Ministry Energy, Mines, Petrol. Res. (Geol. Br.):
Average concentrations of selected elements in stream sediments for major rock type and by 1:250 000 NTS map sheets, 1983.

To compile the average concentration of Cu, Pb, Zn, Co, Ni, As, Mn and U in over 18 000 stream sediment samples collected in British Columbia by major rock types: intrusive, volcanic, metamorphic, till, carbonate and clastic sediment. The samples were collected during the Federal/Provincial Uranium Reconnaissance Program and the British Columbia Regional Geochemistry Program and were analyzed to National Geochemistry Program standards specified by the Geological Survey of Canada. The average element concentration for each rock type is given for each 1:250 000 NTS map sheet covered in the geochemical surveys to date.

206. KRAMER, J.R., ADEDIRAN, S.A., McMaster Univ. (Geology):
Trace metal-metal oxide interactions in an estuarine environment, 1982-84; Ph.D. thesis (Adediran).

A double gradient salinograd is constructed to determine the uptake of trace metals – iron/manganese oxides and organic particulates in a salinity gradient. The experimental data are compared to results obtained in the Le Have Estuary, Nova Scotia.

207. KRAMER, J.R., FULFER, K., GLEED, J., TURNER, L., McMaster Univ. (Geology):
Aluminum species definition in natural waters, 1982-84; M.Sc. thesis (Turner).

Seen
Comparison of atomic absorption spectrometric, spectrophotometric, and fluorimetric methods for determination of aluminum in water; Analytica Chimica Acta, vol. 134, p. 369-373, 1982.

The potentiometric titrations are carried out for various aluminum concentrate levels to better define the monomeric and polynuclear hydrolysis complexes of Al. H.P.L.C. separation of organics with carboxyl groups are studied to ascertain the organic complexing of Al. These laboratory results are combined with other studies to define the analytical speciation method for Al in low pH surface waters.

208. LACROIX, R., PERRAULT, G., École Polytechnique (Génie minéral):
Ghéologie de la mine New Pascalis, Québec, 1983-85; thèse de M.Sc.A. (Lacroix).

Recherche des principaux paramètres structuraux, géochimiques et pétrologiques du gîte de la mine New Pascalis, Québec,

209. MOSSMAN, D.J., MACKINTOSH, A.D., Mount Allison Univ. (Geology), Cominco (Potash Division):
Nature, origin and prediction by geochemical and associated techniques of salt solution collapse phenomena in bedded potash deposits, 1982-.

Seen
Mineralogy of clay marker seams in some Saskatchewan mines; Can. J. Earth Sci., vol. 19, no. 11, p. 2126-2140, 1982.

The identification of sepiolite in the Prairie Evaporite Formation of Saskatchewan; Can. Mineralogist, vol. 20, p. 131-134, 1982.

To classify by kind, to gain an understanding of the various geologic origins (and the processes involved), and to learn how to predict by geochemical and geophysical means the whereabouts, of salt-solution collapse features within the potash ore zones of Canadian potash mines.

210. PELLETIER, M., LALONDE, J.-P., Québec Ministère Énergie et Ressources:
Géochimie des eaux souterraines de la région nord des Appalaches, 1983-84.

Inventorier la région des Appalaches pour ses possibilités minières en utilisant l'approche de la géochimie des eaux souterraines dans les régions habitées.

211. SAVOIE, A., PERRAULT, G., FILLION, G., École Polytechnique (Génie minéral):
Ghéologie de la mine Doyon, Québec, 1982-83; thèse de doctorat (Savoie).

Recherche des principaux paramètres géochimiques, minéralogiques, pétrologiques et structuraux du gîte d'or de la mine Doyon.

212. SCOTT, S.D., Univ. Toronto (Geology):
Experimental studies on refractory sulphide systems, 1970-.

Seen
Phase relations involving pyrrhotite below 350°C; Econ. Geol., vol. 77, p. 1739-1750, 1982.

The compositional variation of refractory sulfide minerals, such as sphalerite and arsenopyrite, is being determined experimentally over a wide range of pressures and temperatures. The results are being applied to sulfide ores as an aid to understanding the physico-chemical conditions of their formation or subsequent metamorphism.

213. SINCLAIR, A.J., MATYSEK, P., CHURCHILL, S., STANLEY, C., Univ. British Columbia (Geological Sciences):
Interpretation procedures for multivariate applied geochemical data; M.Sc. theses (Matysek, Churchill, Stanley).

Seen
Rapid anomaly recognition and ranking for multi-element regional stream sediment surveys; British Columbia Ministry Energy, Mines, Petrol. Res., Paper 1982-1, p. 176-186, 1982.

Cinola gold deposit, Queen Charlotte Islands, B.C. - a geochemical case history; in Levinson, A.A., ed., Precious metals in the Northern Cordillera, Assoc. Expor. Geochemists, p. 121-137, 1982.

Immediate aims of the program are exemplified by the recent publications noted, the first forming part of an M.Sc. thesis by Matysek slated for completion in the spring of 1983. Additional studies are underway to examine optimal use of multi-element geochemical exploration programs for Cu-(Ag) deposits in rocks of the Belt Supergroup and an integration of multi-element exploration data with the geology, an ore genesis model and geography of the area in question (Montana). This work is the basis for an M.Sc. thesis by Stanley. A detailed multi-element soil and rock geochemical study is also under way in an area of gold mineralization in Oregon.

214. SMITH, D.G.W., Univ. Alberta (Geology):
Compositional variations in the metal phases of chondritic meteorites, 1979-.

Electron microprobe investigations of the Innisfree meteorite showed that there is a very great range of Fe, Ni and Co contents in the metal phases of this chondrite. The metal phases of other chondrites have also been found to show very substantial differences in the pattern of variation of the metal compositions, both from those of Innisfree and from one another. However, there does not appear to be any obvious correlation of these patterns with either the group or the petrologic type. It is believed, therefore, that the compositional variations may have been established during mild metamorphism at temperatures very much lower than those promoting equilibration amongst the silicate phases. In addition to the difference in these patterns of variation, there also appear to be substantial differences in the average composition of the metal phases in different chondrites. Once again, however, no correlation with group or petrologic type is apparent. Investigation and interpretation of these variations amongst chondrites that are available to the author for study, is continuing.

215. SPENCER, R.J., Univ. Calgary (Geology and Geophysics):
Geochemical evolution of Devonian evaporites, Alberta-Saskatchewan, 1982.

To obtain information on the physical and chemical conditions of the brines responsible for the formation of Elk Point Group evaporites. Sedimentary fabrics and structures are being employed along with information obtained from fluid inclusions.

216. THORPE, R.I., Geol. Surv. Can.:
Lead isotopic studies on genesis of ore deposits, 1978-.

217. THURSTON, P.C., FRYER, B.J., Ontario Geol. Surv.:
Trace element geochemistry of major units in the Abitibi Subprovince, Ontario, 1980-83.

Analytical work complete, interpretation commencing for the western Abitibi Subprovince.

218. WATKINSON, D.H., GIBSON, H.L., TALKINGTON, R., Carleton Univ. (Geology):
Genesis of metallic mineral deposits, 1978-88; Ph.D. thesis (Gibson).

Ultramafic-mafic rocks and Ni-Cu-PGE-Cr:

results of research on genesis of metallic concentrations indicate that magmatic processes are necessary, but not sufficient, to produce most deposits of chromite, platinum-group minerals (PGM) and nickel-copper.

Cu-Zn mineralization and alteration of volcanic rocks:

study of alteration assemblages around Cu-Zn deposits in volcanic rocks (and their metamorphosed equivalents) has produced very significant results, especially concerning early silicification in the vicinity of many Noranda deposits. This type of alteration is more extensive and somewhat stratabound compared to the commonly described, crosscutting, "pipe" alteration (chloritization, sericitization). As a result, exploration targets may be broadened if this type of alteration is recognized in other areas.

219. ARMSTRONG, R.L., Univ. British Columbia (Geological Sciences):
Cordilleran geochron file, 1980-.

The file now contains more than 2500 items. Recent additions include Rb-Sr and U-Pb data, much of it unpublished and in-progress material.

220. ARMSTRONG, R.L., PARRISH, R.R., VAN DER HEYDEN, P., BROWN, R.L., READ, P.B., SIMONY, P., GHENT, E.D., Univ. British Columbia (Geological Sciences), Carleton Univ. (Geology), Geotex, Univ. Calgary (Geology and Geophysics):
Omineca belt geochronometry, 1975-.

Sees
Geochronology and tectonic evolution of the Priest River Crystalline/Metamorphic Complex; Geol. Soc. Am. Abstracts with Programs, vol. 14, p. 27, 1982.

Geology, chemistry, and geochronometry of the Cretaceous South Fork volcanics, Yukon Territory; Geol. Surv. Can., Paper 82-1A, p. 309-316, 1982.

Precambrian basement, Paleozoic igneous rocks, including carbonatites, Mesozoic plutons, Tertiary plutons and volcanic rocks, and Mesozoic-Cenozoic metamorphic events are under investigation in areas from Spokane, Washington to near Dawson City, Yukon.

221. ARMSTRONG, R.L., SOUTHER, J.G., HARAKAL, J., Univ. British Columbia (Geological Sciences), Geol. Surv. Can.:
Cordilleran Cenozoic volcanic rocks, 1975-.

K-Ar dating of young volcanic centers in Wells Gray, and Garibaldi Belt regions is continuing.

222. ARMSTRONG, R.L., WOODSWORTH, G.J., PARRISH, R.R., VAN DER HEYDEN, P., SCOTT, K., Univ. British Columbia (Geological Sciences), Geol. Surv. Can.:
Coast plutonic belt geochronometry, 1975-.

Sees
Mesozoic-Cenozoic magmatic history of the Canadian Cordillera; Fifth Internat. Conf. on Geochron., Cosmochron., Isotope Geol., 1982.

Application of fission track dating to the Cenozoic tectonic and thermal history of the Coast Mountains of British Columbia, southwest Canada; ibid., 1982.

Age and isotopic composition of Coast Plutonic Complex rocks are under continuing investigation. Projects under way include Alice Arm, Bella Coola, and Vancouver-Pemberton traverses and follow up studies in Tsaytis River area (U-Pb dating of Gamsby Group – Late Triassic – Early Jurassic by P. van der Heyden).

223. BAADSGAARD, H., BRIDGWATER, D., NUTMAN, A.P., LAMBERT, R. St.J., CUMMING, G.L., Univ. Alberta (Geology):
Isotope geology and petrology of the Early Archean of western Greenland, 1971-.

Zircon project on Isua "Conglomerate Boulders" vs. Akilia remnants completed. Can show 3600 Ma metamorphism in outer Godthabsfjord Area is the major high grade secondary metamorphism. Lack of 3600 Ma metamorphism in Isukasia area of W. Greenland brought out by Rb-Sr and U-Pb studies on minerals of the grey Archean gneisses of the area. These are 3600 Ma old sphene samples together with 2500 Ma apatite. The major remobilisation and intrusion of granite gneiss sheets in the Isua area north of Lake Immersuaq is dated by the pegmatites accompanying these sheets. Ion microprobe analyses of zircons from the Isua "boulder conglomerate" show concordant zircons with an age of 3806 Ma.

224. BAADSGAARD, H., CUMMING, G.L., WORDEN, J.M., HOEVE, J., MORTON, R.D., Univ. Alberta (Geology, Physics):
Isotope Geology of western Canadian uranium deposits, 1977-.

A very detailed isotope study of the host rocks, alteration zone and mineralisation has been completed for the Midwest uranium deposit, Northern Saskatchewan. Several episodes of mineralisation and alteration are found and correlated with the regional geology. A wider study on all the sandstone-hosted uranium deposits in the Athabasca area is slowly coming to fruition. Present data offers a single correlation which includes the six different deposits analysed to date. More collecting planned. A side project concerning the nature of silica introduction and formation of coffinite is being planned.

225. BAADSGAARD, H., LERBEKMO, J.F., Univ. Alberta (Geology):
Application of Rb-Sr and U-Pb methods to dating of volcanic ash horizons. Time scale studies, 1981-.

Even though the biotite in many bentonites is weathered, Rb-Sr analysis shows a high degree of isotopic concordance for biotites that have lost less than ~30% of their K(Rb). U-Pb on Cretaceous bentonite zircons is difficult because of the small amounts of radiogenic lead, but good results may be obtained. Slight variations in discordance of the U-Pb zircon results may be due to low levels of initial contamination in the original magma. It has been found very necessary to carry out the sampling very carefully, and to purify the minerals to the handpicked stage as well as carry out acid cleaning.

226. BELL, K., MACDONALD, R., Saskatchewan Geol. Surv., Carleton Univ. (Geology):
Saskatchewan shield geochronology project, 1973-.

Sees
Saskatchewan Geol. Surv., Misc. Rept. 82-4, 1983.

This ongoing program, provides a framework of Rb/Sr isotopic data, in the Saskatchewan Shield.

227. BERGER, G.W., HUNTLEY, D.J., Simon Fraser Univ. (Physics):
Dating volcanic ash by thermoluminescence, 1981-83.

A new method has been developed for directly dating Quaternary tephra. Non-volcanic sediments are difficult to date by thermoluminescence (TL) because the zeroing or resetting process (thought to be by sunlight) is partial and not fully understood. On the other hand, juvenile tephra constituents have a simple zeroing process – heat. Volcanic feldspars were known to exhibit dramatic anomalous fading and therefore must be avoided. The TL properties of airfall glass, however, were known. We applied the well-developed techniques for dating pottery by TL to several well-documented ash deposits from British Columbia and the United States. Many of these are almost 100% clear glass in the 2-11 μm size fraction which we analyzed. The glass exhibits no anomalous fading, has good sensitivity to ionizing radiation and shows no supralinearity. For Mt. St. Helen's Wn and Yn, and Mazama ash the TL dates agree closely with known deposition ages. Several older samples give only minimum TL dates because of anomalous fading by contaminating feldspars. Among these, the 730 ka Bishop ash shows fading and a TL apparent age about half the expected value. Another sample, the Coutlée tephra from Merritt, British Columbia, was heretofore known only to be >35 ka in age. Even though it also exhibits anomalous fading, its TL apparent age is >500 ka, a surprisingly old date. We have developed efficient procedures for separating 4-11 μm sized minerals by heavy liquids but have not yet applied these to tephra.

228. CORMIER, R.F., Saint Francis Xavier Univ. (Geology):
Rb/Sr dating in the northern Appalachians with emphasis on granitic plutonic rocks and acid volcanics, 1962-.

At present, we are working on granitoid rocks from southwestern Nova Scotia (Wedgeport pluton, Brenton pluton, Barrington pluton, Shelburne pluton) and Cape Breton Island (Loch Lomond granite) as well as Carboniferous acid volcanics from the northern mainland of Nova Scotia (Fountain Lake Group).

229. DAVIS, D.W., EDWARDS, G.R., Univ. Toronto (Geology):
Geochronological and geochemical study of the Kakagi Lake area, northwestern Ontario, 1978-84.

Sees
Zircon U-Pb ages from the Kakagi Lake area, Wabigoon Subprovince, northwest Ontario; Can. J. Earth Sci., vol. 19, p. 1235-1245, 1982.

The Kakagi Lake area consists of a bimodal volcanic sequence overlain by a calc-alkalic volcanic pile and intruded by tonalitic plutons. U-Pb measurements on zircons from volcanic and plutonic rocks throughout the succession have closely defined the igneous chronology which has a time span from 2733 m.y. to 2700 m.y. and demonstrated quasi-contemporaneity for plutonic and volcanic phases. This age data will be used in conjunction with trace element analysis to model evolution of the system.

230. DAVIS, D.W., KROGH, T.E., CORFU, F., Univ. Toronto (Geology):
Age of the Sudbury irruptive and associated rocks, Ontario, 1981-83.

The Sudbury norite has been dated by U-Pb zircon analysis at 1850 ± 1.1 m.y. Samples have recently been obtained from the micropegmatite, the sublayer, the Onaping tuff and some granitoid phases such as the Levack gneiss, the Murray granite and granitic dykes intruding the norite. Preliminary data on the Murray granite gives an age of 2335 m.y. while zircon systematics from a granitic dyke intruding the norite indicate that it may have suffered crustal contamination. Zircons have been obtained from the Onaping tuff and are presently being analyzed to determine the age of the Sudbury event.

231. DAVIS, D.W., KROGH, T.E., HINZER, J.B., TROWELL, N.F., Univ. Toronto (Geology):
Resolution of volcanic stratigraphy in the South Sturgeon Lake Volcanics, northwestern Ontario, 1978-83.

Sees
U-Pb zircon ages from the eastern Savant Lake-Crow Lake metavolcanic-metasedimentary belt, N.W. Ontario; Can. J. Earth Sci., vol. 19, p. 868-877, 1982.

The South Sturgeon Lake volcanics consist of three major cycles erupted over a time span from at least 2733 m.y. to 2718 m.y. This was determined by zircon dating of the topmost cycle and two intrusions into the base of the lower cycle. Seven volcanic samples from the lower two cycles have been collected and are currently being dated in an attempt to resolve the age difference between the cycles and to determine which samples belong to which cycle. Since the lowest cycle has base metal mineralization, this will provide a valuable tool for delineating areas of mineral exploration and may place constraints on the relation between igneous activity and mineralization.

232. DAVIS, D.W., KROGH, T.E., WEBER, W., Univ. Toronto (Geology):
Geochronology of the Knee Lake-Oxford Lake greenstone belt, northern Manitoba, 1982-84.

The Knee Lake-Oxford Lake belt contains a polycyclic volcanic sequence, the Hayes River group, which is separated by a major unconformity from the overlying Oxford Lake group consisting of sediments and shoshonitic volcanics. Five samples have been collected from this area for U-Pb zircon analysis. These should give ages for the top of the Hayes River group, the Oxford Lake group and possible basement to the greenstone belt.

233. DAVIS, D.W., SUTCLIFFE, R.H., Univ. Toronto (Geology):
Chronological evolution of the Rainy Lake dome, northwestern Ontario, 1981-83.

The Rainy Lake area consists of a large tonalitic gneiss dome with enfolded amphibolites and later granitoid phases. Zircons have been obtained from three of the gneissic phases, an amphibolite and three massive granitoid phases. Age analyses are currently underway. The age data will be combined with geochemical data previously obtained to develop a model for the origin and development of the gneiss dome.

234. DAVIS, D.W., SUTCLIFFE, R.H., Univ. Toronto (Geology):
Geochronology of the Nipigon Plate, Ontario, 1981-83.

Four samples of Keweenawan rocks have been collected for U-Pb dating from around Lake Nipigon: two samples from a Logan sill, a rhyolite from the Ostler volcanics and a rhyolite from recently discovered volcanics which represent the earliest phases of Keweenawan volcanism. The two rhyolites contain abundant zircon while the diabase samples contain baddeleyite which should be suitable for dating. The age analyses will be combined with a structural and geochemical study of the evolution of the Nipigon Plate.

235. DOIG, R., McGill Univ. (Geological Sciences):
Rb-Sr geochronology of gneissic terrain north of the Cape Smith foldbelt, Québec, 1981-84.

236. EASTON, R.M., Ontario Geol. Surv.:
Isotopic age compilation of Ontario, 1982-83.

Produce a map showing areal distribution of isotopic ages in Ontario all connected to IUGS 1977 constants.

237. GABITES, J.E., ARMSTRONG, R.L., GREENWOOD, H.J., McTAGGART, K.C., ROSS, J.V., Univ. British Columbia (Geological Sciences):
Geology and geochronology of an area near Hope, British Columbia, 1981-83; M.Sc. thesis (Gabites).

Two years field mapping and sample collection completed; no further field work intended. Detailed structural and metamorphic analysis of schist sequence is in progress. Metamorphic rocks in the area are divided into 2 lithologically distinct units separated by a imbricate zone of tectonic slices of ultramafic and mafic rocks. The sequence has been intruded during the Cretaceous and Tertiary by diorites and granodiorites. Geochronology is being used to unravel the tectonic sequence. The high grade schist has been dated by Rb-Sr as Triassic-Jurassic. The diorite yields K-Ar and Rb-Sr ages in the Cretaceous. Zircons are being extracted for U-Pb dating.

238. HANES, J.A., Queen's Univ. (Geological Sciences):
Cooling history of orogens by thermochronometric and petrologic studies, 1981-.

To study the cooling history of orogens by petrological and argon isotope geochronological methods, concentrating initially on the Haliburton Highlands of the Grenville Province, Ontario. A simple, surprisingly slow, cooling history, based on data from mafic intrusions, was recently constructed for this area by workers at the University of Toronto using the new technique of argon isotope 'thermochronometry'. The present project will utilize approaches independent of this method, as well as further thermochronometry, to attempt to distinguish between a simple and complex cooling history for the Grenville orogen. Detailed field and petrographic studies, and cation exchange geothermometry, will be applied to the Haliburton intrusions and surrounding gneisses to construct an independent thermal history. The effects of retrograde re-equilibration will be sought for and analyzed quantitatively with the electron microprobe. Simultaneously the argon geochronology system at Queen's will be modified to permit detailed incremental-heating argon-40/argon-39 experiments in order to determine mineral closure temperatures as well as ages. With this thermochronometric capability, further time-temperature information will be gathered from the gneiss and intrusions.

239. HOEVE, J., QUIRT, D., Saskatchewan Research Council (Geology):
Uranium metallogenesis of northern Saskatchewan.

See:
Clay mineral host rock alteration at the Midwest Lake uranium deposit; Sask. Res. Council., Publ. No. G-765-9-E-81, 1982.

Completing a synthesis of relationships between diagenesis of the Athabasca Group and uranium mineralization and remobilization. A study of soda metasomatism and the formation of Hudsonian vein-type uranium deposits at Beaverlodge, Saskatchewan is progressing.

240. HUNTLEY, D.J., BERGER, G.W., DIVIGALPITIYA, W.M.R., BROWN, T.A., Simon Fraser Univ. (Physics):
Thermoluminescence dating of sediments, 1975-; M.Sc. thesis (Divigalpitiya).

See:
Thermoluminescence dating of sediments (a review); Quaternary Sci. Reviews, vol. 1, p. 31-53, 1982.

To establish which kinds of sediments can be dated and how to obtain correct ages for them by choosing well-defined sediments of known ages to study.

241. HUNTLEY, D.J., CALVERT, S.E., NISSEN, M., Simon Fraser Univ. (Physics):
Use of alpha counting to obtain uranium, thorium, Th-230 excess and Pa-231 excess contents in deep-ocean sediments: use of glass samples, 1982-83.

We have found severe disagreement in Th-232 and Th-230 excess values between our measurements and those made by alpha spectrometry. This is believed to be due to radon escape from our powder samples. We have made a set of samples into glass using a lithium borate-carbonate eutectic and found most of these samples now give satisfactory agreement. Further tests, including blind tests, are underway.

242. LAROCQUE, C.A., DOIG, R., McGill University (Geological Sciences):
Geochronology and petrochemistry of Appalachian granitic rocks, Gaspé Peninsula, Québec, 1981-83.

243. MATHEWS, W.H., Univ. British Columbia (Geological Sciences).
Early Tertiary resetting of K-Ar dates in the Okanagan valley and its relationship to Eocene rocks and non-reset rocks to the west, British Columbia, 1981-.

See:
Early Tertiary resetting of potassium-argon dates in the Kootenay arc, southeastern British Columbia; Can. J. Earth Sci., vol. 20, no. 5, p. 867-872, 1983.

244. PARKINSON, D.L., ARMSTRONG, R.L., Univ. British Columbia (Geological Sciences):
Geochronology and regional aspect of some granitic bodies in Okanagan Valley, British Columbia, 1982-84; M.Sc. thesis (Parkinson).

To attempt to unravel the deformational history of the area by dating (using U-Pb, Rb-Sr, and K-Ar methods) synkinematic and post kinematic granitic bodies. In addition to this, work will be done to understand relationships between the high grade metamorphic rocks east of the valley and the lower grade metamorphic rocks west of the valley.

245. TUREK, A., CARSON, T., Univ. Windsor (Geology):
Geochronology of the Island Lake area, Manitoba, 1982-84; M.Sc. thesis (Carson).

See:
Rb-Sr and U-Pb ages of volcanism and granite emplacement in the Michipicoten belt – Wawa, Ontario; Can. J. Earth Sci., vol. 19, p. 1608-1626, 1982.

To establish the Archean chronostratigraphy for the Island Lake area. Geochronology for the Michipicoten belt – Wawa, Ontario has now been completed and in part reported.

246. TURNER, J.T., FRITZ, P., KARROW, P.F., WARNER, B.G., Univ. Waterloo (Earth Sciences):
Carbon isotopes in marl lakes and their effect on radiocarbon dating, southern Ontario and United States, 1979-83.

A manuscript is in preparation on a study of marl sediment dating problems at Corry, Pennsylvania.

247. LAST, W.M., Univ. Manitoba (Earth Sciences):
Computer well file for Manitoba, 1982-83.

I am setting up a computer storage, retrieval and manipulation system based on a limited number of wells in the province. The specific objectives are to: 1) develop a working storage file of formation top elevations, well locations, well status, and other pertinent geological information; and 2) conduct preliminary manipulations of this information, such as generating contour maps, trend surface maps and correlation sections. Well information will greatly enhance the subsurface mapping capabilities and the geologist's ability to understand the Paleozoic and Mesozoic strata of Manitoba.

248. MACGILLIVRAY, J.R., HAMILTON, W.N., Alberta Research Council (Geol. Surv.):
Information geology, 1974-.

GEODIAL now includes all published and unpublished geoscience reports of Alberta Research Council (to end of 1981), the complete works of Canadian Society of Petroleum Geologists (to end of 1981), published and unpublished reports of the Geological Survey of Canada that pertain to Alberta (to end of 1980), and theses pertaining to Alberta. Journal literature is targeted for completion in 1983/84.

249. O'DRISCOLL, C.F., DEAN, P.L., Newfoundland Dept. Mines and Energy:
Mineral occurrence data system, 1978-.

Sees
Mineral occurrence map – Snegamook Lake (13/K); Newfoundland Dept. Mines and Energy, 1983.

Mineral occurrence map – Wuchusk Lake (13K/5); ibid., 1983.

Mineral occurrence map – Kaipokok Bay – Big River (13/J & O); ibid., 1983.

Mineral occurrence map – Sandy Lake (12/H); ibid., 1983.

A two-part project comprising a manual Mineral Inventory File and a Computerized Mineral Index. The manual file contains information which summarizes all available data on each known mineral occurrence. The computerized index contains coded and free format data on mineral occurrences, selectively extracted from the manual file. Its purpose is to efficiently organize important data so that a wide variety of retrievals can be made, taking advantage of the powerful sorting capabilities offered by computerization. Mineral occurrence maps of various scales are published when areas are completed. These maps are plotted on undated geological bases, and contain mineral occurrence locations, names, status and minerals present.

250. SINCLAIR, A.J., GOLDSMITH, L.B., Univ. British Columbia (Geological Sciences):
Statistical models for exploration and evaluation of mineral deposits in British Columbia, 1982-; M.Sc. thesis (Goldsmith).

Sees
A preliminary analysis of gold and silver grades of porphyry-type deposits in Western Canada; in Levinson, A.A., ed., Precious metals in the northern Cordillera, Assoc. Explor. Geochemists, p. 137-172, 1982.

Resource assessment of gold-quartz veins, Zeballos Mining camp, Vancouver Island – a preliminary report; British Columbia Ministry Energy, Mines, Petrol. Res., Paper 1983-1, 1983.

Spatial density of silver-lead-zinc-gold veins in four mining camps in southeastern British Columbia; ibid., 1983.

A computer-based procedure for quantifying geological data for resource assessment; ibid., 1983.

The project encompasses several independent studies, including an evaluation of quantitative production and geological information for the Zeballos gold camp and a multi-variate approach to examining exploration potential of the Guichon Creek batholith. Progress reports on both these studies are listed in the publications and final reports are in preparation. In addition we have examined spatial densities as a general procedure for outlining geographic limits to vein camps and are nearing completion of a study of quantitative production data from the Trout Lake vein camp in southern British Columbia.

251. TESKEY, D.J., Geol. Surv. Can.:
Development of regional geophysical data processing and interpretation, 1982-.

GEOMATHEMATICS/MATHEMATIQUE DE LA TERRE

252. AGTERBERG, F.P., Geol. Surv. Can.:
Probability models for estimating mineral potential, 1969-.

Sees
System of interactive computer programs for quantitative stratigraphic correlation; Geol. Surv. Can., Paper 83-1A, p. 83-88, 1983.

253. AGTERBERG, F.P., Geol. Surv. Can.:
Mineral and energy resource evaluation; probabilistic methods, 1976-.

254. FABBRI, A.G., Geol. Surv. Can.:
Quantification of geological variables and geomathematical estimation of mineral potential, 1972-.

Sees
Interactive processing of geological images; Geol. Surv. Can., Paper 83-1A, p. 53-63, 1983.

255. SABOURIN, R.L.S., BOYLE, R.B., EMR (CANMET):
Uranium reserves and production – assessment methodology, 1975-83.

Sees
Computer use in resource evaluation – CANMET'S systems for mineral reserve evaluation; Report ERP/MRL 83-1 (J), CANMET, 1983.

Guide for coding drillhole data from uranium deposits, Version 3; Report ERM/MRL 82-63 (TR), CANMET, 1982.

The source code of these computer programs has been registered on a single magnetic tape which is now accessible to the public. These programs have to be run on a Control Data Computer. It is intended to transform them to be compatible to an IBM computer machine.

A new program will be implemented to allow the coding of data, using an interactive procedure. Advanced geostatistical techniques such as disjunctive kriging and transfer functions should be part of the system in the second version.

256. SABOURIN, R.L.S., BOYLE, R.F., EMR (CANMET):
Geostatistical derivation of coal reserves for Estevan, southern Saskatchewan, 1982-83.

To produce an inventory of coal reserves for the Estevan area in southern Saskatchewan, utilizing methodology developed the previous year and reported in Divisional Report ERP/MRL 82-28(TR) entitled "Methodological Development for a Reserve Inventory of Coal in southern Saskatchewan (March, 1982). Geostatistical techniques are used to evaluate a number of mining operation variables.

257. SINCLAIR, A.J., GIROUX, G.H., Univ. British Columbia (Geological Sciences):
Geostatistical approaches to estimation of reserves of Silver deposits in the Canadian Cordillera, British Columbia, 1980-83; M.A.Sc. thesis (Giroux).

This project has dealt with detailed applications of geostatistical ore reserve estimation procedures to two categories of silver deposits, vein and bulk silver deposits, in particular the Keno No. 18 vein of United Keno Hill Mines Ltd. and the Southern Tail zone of Equity Silver Mines Ltd. The Keno Study is completed and has demonstrated a remarkable control on semi-variogram models for different elements (Pb, Zn, AG) and metal zoning in the vein. In addition, the case history demonstrates the usefulness of semi-variogram models derived early in the exploration history of a vein.

Geostatistics applied to the South Tail zone encounters numerous difficulties that must be approached through declustering techniques and conditional probability in the case of global estimates, and procedures such as multi-gaussian kriging in the case of local estimates. All formal studies are completed and final reports are in preparation on all aspects of this project.

258. ZODROW, E.L., College of Cape Breton (Geology):
Trace elements in Cape Breton coals, 1983-84.

To investigate variations and co-distribution of uranium and thorium and hence estimate their contents in the major coal seams of Sydney Coalfield; to provide useful data for basin development.

259. ALGUS, M., CARSON, M.A., BIRD, J.B., McGill Univ. (Geography):
Morphology of and processes on, coastal bluffs in permafrost sediments, Quivitu, Baffin Island, 1969-84; Ph.D. thesis (Algus).

Wave-eroded bluffs developed in glacial and marine sediments have been examined in terms of their variable morphology, sediment type and processes of erosion acting upon them, along a 13 km stretch of coastline. Slope types belong to one of four major categories: 1) undissected, debris-mantled slopes standing at the angle of repose of the coarse gravel that forms a sedimentary cap in some areas; 2) steep (>45°), faceted scarps, cut in predominantly sandy sediment, and frequently dissected by small gullies and debris hoppers; 3) coalescing debris-bowls, with steep back and sides, and low-angled (<10°) colluvial tongues, found where silt-caly units occur in the lower slope; and 4) bluffs dominated by a low-gradient bench at mid-slope, seated at the level of a thick silt-clay unit. The last type is interpreted as the extreme stage of debris-bowl development, operating under inferred lower rates of wave undercutting. Attention is being focussed on the mechanisms by which mass-movement is able to take place on such low gradients found in the debris bowls and mid-bluff bench. Observations of pore pressures during thaw will be made in 1983, together with field evaluation of mechanisms that might produce transient excess pore pressures.

260. BINDA, G., JOHNSON, P.G., Univ. Ottawa (Geography):
Fluvioglacial sediment and hydrochemical dynamics; implications for glacial geomorphology, 1981-83; M.A. thesis (Binda).

The project consists of an investigation of suspended sediment and hydrochemical dynamics of the discharge of Peyto Glacier, Alberta. There are three main objectives to this study. First, to investigate the temporal variations in selected hydrochemical parameters of the meltwaters as a potential indicator of changes in the contribution area of the basin to discharge. Second, to measure the temporal variations in suspended sediment concentration in relation to the release mechanisms from the glacier system (climatic and glaciological conditions). Third, to analyse the grain size, and the physical and mineralogical characteristics of the suspended sediment.

261. CARSON, M.A., McGill Univ. (Geography):
Flowslides in sensitive sediments: mechanisms and distribution, 1976-82.

Field examination of flowslide scars in the St-Lawrence Lowlands was undertaken to provide an insight into the mechanisms at work in these retrogressive failures. Findings indicated that spreading failure (with horst-graben displacements), rather than repeated rotational slips, was the norm. A model for predicting the onset, and the severity, of such failures was developed, emphasizing both the undrained strength and sensitivity of the sediment. Mapping of flowslide scars in the Lachute area reveeled a strong correlation with the spatial variability in sediment sensitivity and porefluid salinity. Marked regional differences in salinity were shown to correspond to the variability in thickness of the silt-clay sediment, determined by the topography of the initial sea floor: areas of thick silty-clay sediment still retain high overall porefluid salinity and have not been susceptible to flowslides. Use of earth resistivity measurements for mapping areas which are safe from flowslides is suggested by this work. Severity of retrogression was shown to depend on the magnitude of strength loss during failure: medium-strength clays usually produce blocky (or "ribbed") spoil, and maximum retrogression is controlled by valley size, ie, the cross-sectional capacity to accommodate the spoil. Weak "clays", which disturb to a fluid state, in contrast show extrusion along-valley during failure: here retrogression is controlled far more by the character of the slide hinterland.

262. DEWEZ, V., GEURTS, M.A., Univ. Ottawa (Géographie):
Paléogéographie de la Ruby Range, Yukon, 1981-86; thèse de doctorat (Dewez).

Voir:
La Dualite glaciaire-Périglaciaire et l'origine de certaines formes dues a la font de glace; Notes de Recherches Dept. Géographie, Univ. Ottawa, vol 34, 1982.

Evolution géomorphologique de la Chaine Ruby au Quaternaire et Postglaciaire. Plusieurs section de la chaine ont déja été levés et ce travail on poursuivra durant l'été 1983. Une attention particuliere et portée à l'agencement et la répartition et la nature des formes et du dépots.

263. DRAKE, J.J., McMaster Univ. (Geography):
Estimates of long-term erosion rates, 1982-.

To estimate the significance of modern basin erosion rates to the long-term rate. The work will include the use of models linking erosion rates to climatic parameters, and of long-run climatic records reconstructed from proxy data.

264. DUBOIS, J.M.M., Univ. Sherbrooke (Géographie):
Bibliographie sur les caractéristiques physiques des Cantons de l'Est, Québec, 1971-.

6 000 références ont été publiés à date pour couvrir tout le domaine physique des Cantons de l'Est. Les références sont regroupées par thèmes. L'acquisiton de données est continuelle. Un septième rapport est prévu en 1983.

265. DUBOIS, J.M.M., DIONNE, J.C., Univ. Sherbrooke (Géographie), Univ. Laval (Géologie):
Télédétection et cartographie des fronts glaciaires sur la Côte Nord du Saint-Laurent entre le lac Saint-Jean et le Labrador, 1978-83.

266. DUBOIS, J.M.M., LAURIOL, B., GWYN, Q.H.J., Univ. Sherbrooke (Géographie):
Le Quaternaire et l'évolution littorale des îles Saint-Pierre et Miquelon, 1979-84.

Etude du Quaternaire, des phénomènes périglaciaires et éoliens et de l'évolution du littoral. Production d'une carte géomorphologique.

267. DUBOIS, J.M.M., LESSARD, G., Univ. Sherbrooke (Géographie):
Géomorphologie, télédétection et évolution littorale de la Côte Nord du Saint-Laurent, Québec, 1976-84; thèse de maîtrise (Lessard).

Etablir les relations entre les tendances millénaires, centenaires, décennales, annuelles et saisonnières d'évolution du littoral à partir de données géologiques, géomorphologiques, historiques et de terrain. Etablir si la côte actuelle à des tendances à l'érosion ou à la sédimentation et pourquoi.

268. ELSON, J.A. McGill Univ. (Geological Sciences):
Physical weathering of quartzite and meta-gabbro, Sudbury region, Ontario, 1972-84.

Weathering products are collected from 5 plots each on gabbro and quartzite, on alternate years, and grainsize analyses made as well as total quantities produced per unit area measured. Data for 7 years show consistencies in grain size but a general descrease in quantity for reasons that are not yet understood but may have to do with disruption of equilibrium by the removal of material. The production of coarse fragments is being studied by recurrence interval analyses, which will give better understanding of the formation of talus.

269. FORBES, D.L., Geol. Surv. Can.:
Morphology, sedimentology, and dynamics of Newfoundland coast, 1981-.

270. FORD, D.C., McMaster Univ. (Geography):
Karst of Canada, 1973-1983.

See:
The effects of glaciations upon karst aquifers in Canada; J. Hydrology, Feb. 1983.

271. JOHNSON, P.G., Univ. Ottawa (Geography):
Structure form and mechanics of flow of rock glaciers, and their occurrence in the Holocene, 1975-.

Investigations during the last three years have demonstrated the importance of the hydrological systems of ice masses, ice rich sediments and ice free sediments to the development of mass movement forms in alpine/subalpine areas. Many of the areas studied are characterised by mass movement forms along the valley margins and the evolution of these forms ranges from steady state mechanisms due to ice content and ice/water systems to low frequency high magnitude events due to hydrostatically controlled events and dry events. The purpose of this research is to concentrate on the understanding of the geomorphology and hydrological systems of the surficial materials of the study areas (glacier ice, glacial debris ice cored, glacier debris not ice cored and talus) by the application of hydrological and hydrochemical techniques. This information will be used to determine the internal characteristics of the forms, as has been attempted in Grizzly Creek, and this to provide input for the modelling of the flow mechanisms. Water is the crucial element of the systems and the changes in water availability in past glaciation time has controlled the types and periods of formation of the flow forms. Hydrostatic conditions are hypothesised as both trigger mechanism and flow mechanism and hydrostatic pressure build up is possible even in coarse materials due to permafrost occurrence. The hydrological systems of glaciers are the base for the understanding of the ice cored forms and this aspect of the study will be concentrated on Peyto Glacier, Alberta.

272. KODYBKA, R.J., JOHNSON, P.G., Univ. Ottawa (Geography):
Characteristics and spatial/temporal distribution of low frequency, high magnitude mass movement phenomena in subalpine environments, Ruby Range, Yukon Territory, 1981-84; Ph.D. thesis (Kodybka).

Initial air photo interpretation of the area has been accomplished. From this, areas of probable or possible ice mass convergences were identified for further follow up work (summer 1982). Extensive ground surveys of these areas included sampling of ridges, valleys and morphological forms, as well as detailed descriptions of these areas (surficial deposits, etc.).

Aims: 1) the determination of the spatial distribution of high magnitude mass movement phenomena; 2) evaluate the mechanisms of formation of high magnitude phenomena, including the physical properties of the materials and their derivation; 3) to date the time of occurrence of the phenomena using traditional techniques and exploring new techniques to overcome problems encountered with dating in the Ruby Range and St. Elias Mountains; 4) the identification of glacial events in the study area employing trace element techiques as

well as traditional glacial geomorphological techniques; and 5) to relate the date of time of occurrence of phenomena to glacial events, thus to paleoclimatic conditions at the time of phenomena formation.

273. LAGAREC, D., LEMAITRE, S., Univ. Ottawa (Géographie):
Etude climatique de la vallée Gladstone, Ruby Range, Yukon, 1981-83.

Etat des travaux: Détermination du comportement estival de la vallée par rapport à la chaîne (thèse en cours). Objectifs: Etude de la distribution spatiale des variations climatiques possibles selon les types de circulation atmosphérique; détermination des possibilités de glaciation locale dans le Ruby Range; effets des variations climatiques sur le pergélisol.

274. LAPOINTE, M.F., CARSON, M.A., McGill Univ. (Geography):
Patterns of meander migration on the Rouge and Diable Rivers in relation to sediment and water movement through channel bends, 1979-83; M.Sc. thesis (Lapointe).

See:
The inherent asymmetry of river meander planform; J. Geol., vol. 91, no. 1, p. 41-55, 1983.

Patterns of channel migration have been examined on the meandering, sand-bedded Rouge and Diable Rivers of the Quebec Laurentians, using air photographs between 1928-1978. The study was prompted by the well-developed sinuosity of the rivers, the rapidity of migration rates reported by landowners, the availability of discharge data (Range), and ease of access. More importantly, if afforded the opportunity to contribute to an area of long-established research in geomorphology that is still dominated by theory and flume work, rather than by field observation. The two rivers (generally unconfined) both display a striking asymmetry in their planforms, with meander loops being dominated by convex-downvalley arcs. At high inflection angles, such asymmetry also manifests itself in loop axes that are skewed upvalley. Long-term evolution of these planforms has been determined by the study of scroll patterns on floodplains; in turn, these have been related to medium-term changes identified from air photographs. Field observations on channel process and bank characteristics during the 1981 spring and summer have been used to explain the typical evolution pattern and resulting planform. Further study of the structure of the helical flow pattern in the meanders is needed, and will, hopefully, be made in the spring of 1983. Examination of planforms on other meandering rivers in N. America suggests that the findings have general validity.

275. LAURIOL, B., GRAY, J., Univ. Sherbrooke (Géographie):
Géomorphologie Quaternaire du sud de l'Ungava, Québec, 1980-82; thèse de doctorate (Gray).

Voir:
Evolution de la calotte glaciaire de la fin du Wisconsin: les évidences morphologiques; IIe Congrès de l'INQUA, Moscou, 1982.

Evolution de la calotte glaciaire de la fin du Wisconsin: les évidences fournies par les isobases lacustres et marines; IIe Congrès de l'INQUA, Moscou, 1982.

276. MACKAY, J.R., MATHEWS, W.H., Univ. British Columbia (Geography, Geological Sciences):
Geomorphology and Quaternary history of the Smoking Hills and lower Horton River, Northwest Territories, 1982-83.

277. MACLEAN, P.A., CARSON, M.A., McGill Univ. (Geography):
Large scale aeolian dunes of the Lake Athabaska region of northern Saskatchewan, 1980-83; M.Sc. thesis (Maclean).

Studies were undertaken during June-August 1981 of large scale aeolian dunes on the sand plateau south of Lake Athabaska and west of the William River. In morphology the dunes show features of transverse, longitudinal and parabolic fans. Averaging 120 m in width, 1000 m in length and 20 m in height they are some of the biggest in N. America. Several are sinuous in plan but most show a slight arc convex to the northeast; long axes are aligned NNW-SSE; interdune spacing is variable. Structural observations were made with 1 metre deep trenches; several organic horizons were dated by GSC, using C-14, to provide rates of migration of the dune forms. Patterns of score and accretion were determined on three dunes, following each wind event, and were related to wind strength and directions. Observations of wind velocity were compared with concurrent readings at weather stations in Fort Chipewyan and Uranium City, allowing utilization of longer term (20 year) records on the sand field. Sand roses show major components from SE, NW and NE. All three winds affect present sand movement on the dunes and in inter-dune areas, and are reflected in the resultant dune morphology and structure.

278. PROVENCHER, L., Univ. Sherbrooke (Géographie):
Caractéristiques biophysiques de la réserve Frontenac, Cantons de l'Est, Québec, 1980-85.

Cartographic et anlayse géomorphologique de la réserve Frontenac, Quebec.

279. SCHREINER, B.T., Saskatchewan Research Council (Geology):
Surficial geology of Saskatchewan, 1978-84.

Mapping of the Precambrian Shield area was completed in 1980. Mapping of the southern part of Saskatchewan, south of 52° N. Latitude, was completed in 1982. Work is continuing on the central part of Saskatchewan which involves fourteen 1:250 000 NTS map areas. Three NTS areas have been compiled and the remaining maps will be completed in 1983/84. All information at the 1:250 000 scale will then be compiled to 1:1 000 000 for publication in 1984.

280. SCHWARTZBURG, R., JOHNSON, P.G., Univ. Ottawa (Geography):
Exploratory study of the geomorphic implications of lacustrine hydrology and hydrochemistry, Yukon, 1981-83; M.Sc. thesis (Schwartzburg).

To show how hydrology and hydrochemistry can be used as tools in the geomorphic interpretation of a lake basin; to show where the source of water is for the lake, i.e., groundwater/subsurface water and not from the inflow source creek (due to morphological conditions); to investigate the physical regime of a northern latitude's lake.

281. SMITH, R.L., JOHNSON, P.G., Univ. Ottawa (Geography):
The effects of the geomorphology of Gladstone Creek headwater lake on its hydrological system, Yukon Territory, 1981-83; M.A. thesis (Smith).

To study the effects of the geomorphology on the hydrological regime of the headwater basin of Gladstone Creek, southwestern Yukon Territory; to investigate the influence of the headwater lake's surrounding landforms on the hydrochemistry of the streams running over and through these forms; and to calculate the contribution of the surface and nearsurface routing of water over and through the landforms to the storage and discharge of the system.

The observations, analysis, and conclusions of this thesis provide a preliminary investigation on the effects of a headwater basin's geomorphology on its hydrological system. The study has completed its data collection. Work continues in terms of the interpretation of the results, their representations, and the drawing of conclusions.

282. WORTHINGTON, S.E., FORD, D.C., McMaster Univ. (Geography):
Speleogenesis of the Canadian Hole-Friar's Hole System, West Virginia, 1982-83; M.Sc. thesis (Worthington).

ELECTRICAL/MÉTHODES ÉLECTRIQUES

283. BAZINET, R., CHOUTEAU, M., École Polytechnique (Génie minéral):
Etude géotectonique, par magnétotellurique de la ceinture volcanique de l'Abitibi, Québec, 1983-84.

Essayer de déterminer l'origine structurale des "lourds" gravimétriques observés en Abitibi. Obtenir des informations sur la structure profonde de la croûte terrestre dans le but d'isoler les régions présentant un intérêt minier.

284. BAZINET, R., TRUDEL, P., École Polytechnique (Génie minéral):
Evaluation du potentiel minéral des grands axes structuraux relevés par la méthode INPUT, 1983-85.

Evaluer les différentes méthodes d'exploration susceptibles d'isoler des gisements économiques dans des conducteurs structuraux de grande dimension relevés en Abitibi par la méthode Input.

285. COUTURE, D., BAZINET, R., École Polytechnique (Génie minéral):
Interprétation des diagraphies TBF, 1982-83; thèse de maîtrise (Couture).

Un jeu de programmes d'interprétation opérant sur micro-ordinateur a été produit. Des abaques d'interprétation ont été réalisées à partir des programmes. Il nous reste à finaliser les programmes et les abaques ainsi qu'à rédiger les rapports définitifs.

286. CRONE, J.D., Crone Geophysics Ltd., Ontario Geol. Surv.:
New digital pulse EM receiver, 1981-84.

Development of a Pulse EM receiver using a microprocessor for internal control and noise processing, incorporating memory data storage and interface with a FIELDCOM computer for data processing and plotting.

287. DYCK, A.V., Geol. Surv. Can.:
Borehole geophysics (electrical and magnetic techniques), 1974-.

288. KLEIN, J.D., HALLOF, P.G., Phoenix Geophysics Ltd., Ontario Geol. Surv.:
Electrical properties of mineral deposits, 1981-83.

To characterize the spectral IP response of various metallic ores common in Ontario. The project will involve detailed measurement in operating mines of the IP spectra using short electrode spacings. Geologic mapping and sampling coupled with laboratory and field studies will aid development of procedures for improved interpretation of IP data.

289. LAMONTAGNE, Y., MACNAE, J.C., Lamontagne Geophysics Ltd., Ontario Geol. Surv.:
Advanced hardware and software development for ground EM prospecting, 1981-84.

Development of a borehole system comprising probe, data link, programmable controller and winch to interface to the UTEM system. Development of a high power transmitter. Development of transmitter pre-emphasis/receiver deconvolution to improve signal/noise ration. Software developments for ease of data processing and interactive field interpretation.

290. LAZENBY, P.G., BECKER, A., Questor Surveys Ltd., Ontario Geol. Surv.:
Redefinition of the INPUT airborne electromagnetic exploration system, 1981-84.

Building on the well established principles of the Questor/Barringer INPUT system this project will result in the development of a highly improved airborne system for the detection of deep targets below conductive overburden. This objective will be attained by increasing the transmitter moment, modifying the pulse width and reducing the receiver noise.

291. LEFEBVRE, D.L., Québec Ministère Énergie et Ressources:
Relevé électromagnétique héliporté dans la région de Thetford-Mines, Québec, 1983.

Couverture régionale adaptée au contexte géologique. Test d'évaluation sur divers sites. Gîtes visés sont ceux de cuivre, zinc, plomb et argent de type volcanogénique et sédimentaire.

292. LEFEBVRE, D.L., Québec Ministère Énergie et Ressources:
Relevé INPUT dans la région des lacs Troilus et Frotet en Abitibi, Québec, 1983-84.

Couverture régionale de l'Abitibi par la méthode IPUT commencée en 1968. Outil de prospection pour les compagnies d'exploration minière.

293. LEGAULT, J., BAZINET, R., École Polytechnique (Génie minéral):
Etude d'un profil magnétotellurique à travers la ceinture volcanique de l'Abitibi, Québec, 1982-84; thèse de M.Sc.A. (Legault).

Obtenir une coupe géoélectrique aussi précise que possible, selon un axe nord sud, de la ceinture volcanique de l'Abitibi.

294. MORRISON, E.B., Geotech Ltd., Ontario Geol. Surv.:
Modification of the Geotech III system to a four frequency multi coil, multi axis helicopter electro-magnetic system, 1981-84.

Modification of the Geotech III frequency helicopter electro-magnetic system into a four frequency system having a lower frequency of 380 Hz. This work will include a test survey at Cavendish.

295. RODRIGUES, E., FLIGG, K., Ontario Ministry Environment (Water Resources Br.):
The application of geophysics in contaminant hydrogeology and groundwater supplies, 1965-.

The assessment of the use of geophysics in defining contaminant plumes around landfill sites and other sources of contamination is continuing. In addition to conventional four-electrode resistivity surveys, electro-magnetic techniques have been utilized in mapping contaminant plumes. Magnetometer surveys have been carried out at abandoned waste disposal sites to locate buried waste containers.

296. SINHA, A.K., Geol. Surv. Can.:
Evaluation of two deep sounding E.M. system, 1981-.

See:
Deep multifrequency E.M. sounding at a site near Bowmanville, Ontario; Geol. Surv. Can., Paper 83-1A, p. 133-137, 1983.

Permafrost mapping over a drained lake by electromagnetic induction methods; ibid., p. 213-220, 1983.

297. SLAWSON, W.F., WATANABE, T., SHIER, R.M., McCOLLOR, D.C., CHAPEL, B.E., FISK, L., Univ. British Coumbia (Geophysics and Astronomy):
E.M. exploration with power line harmonic fields, 1979-83, M.Sc. theses (McCollor, Chapel, Fisk).

An E.M. exploration to infer ground conductivity was carried out by making use of magnetic fields created by a power line carrying currents as a source signal. Measurement of the magnetic field was made over a 10 km x 10 km area adjacent to an isolated major power line of B.C. Hydro. It was found that 60 Hz, 180 Hz, 300 Hz and 420 Hz were the main magnetic field components. This agrees with a result of a direct measurement of the power line neutral current, i.e., the algebraic sum of the 3 phase currents. A plot of the vertical magnetic field measurements, normalized with a standard source current strength, shows that the field strength decreases inversely with the distance from the power line in the vicinity of the source and to the cubic inverse of the distance further away from the source. The crossover point between $1/r^3$ and $1/r^2$ relationships is frequency dependent. A mathematical theory predicts this trend with the crossover distance $\sqrt{2}$ times the skin depth. Application of the theory enabled us to infer the resistivity to be about $10^3\Omega$-m. A deviation from the general trend occurs at the same location for all four frequencies. The location of the deviation corresponds to a mapped geologic feature. Relative strength of the horizontal magnetic field to the vertical component was found to be almost proportional to the distance from the power line. This also agrees with the theory, yielding a resistivity estimate in line with that through observation of the vertical component.

298. STEVENS, A., YAMSHITA, M., McPhar Instrument Corp., Ontario Geol. Surv.:
User friendly EM prospecting system, 1982-83.

Using some of the concepts from an existing proven high power EM system, we will develop a flexible low-cost two-man user-friendly system suited to both the traditional mainstream of mineral prospecting applications and to use in high cultural noise environments. The proposed system will sell for about $12,000.00 to $15,000.00.

299. VALLÉE, M., BAZINET, R., École Polytechnique (Genie minéral):
Magnétotellurique haute fréquence, 1982-84; thèse de docterat (Vallée).

Augmenter vers le haut la gamme de fréquence généralement utiliser en MT de façon à pouvoir utiliser cette méthode pour faire des sondages à faible profondeur ou dans des milieux très résistifs. Développer les appareils et les méthodes d'interprétation nécessaires.

EXPLORATION/PROSPECTION

300. BARLOW, R.B., PITCHER, D.H., Ontario Geol. Surv.:
Night Hawk geophysical test range, Ontario, 1981-84.

See:
Night Hawk Geophysical Test Range Results, Night Hawk Lake, District of Cochrane; Ontario Geol. Surv., Misc. Paper 106, p. 152-161, 1982.

During the 1982 summer season, survey activity continued on the Night Hawk geophysical test range near Timmins, Ontario. In addition to the electromagnetic, gravity, and magnetic gradiometer surveys carried out by staff of the Geophysics/Geochemistry Section, researchers from the Geological Survey of Canada, the University of Toronto, Questor Surveys Limited, Aerodat Limited, and Geonics Limited have carried out experiments using airborne and ground electromagnetic, audiofrequency magnetotelluric, and seismic refraction and reflection techniques.

301. BAZINET, R., TRUDEL, P., Québec Ministère Énergie et Ressources:
Evaluation du potentiel minéral des grands axes conducteurs, 1983-84.

Effectuer des essais qui permettront d'évaluer s'il est possible de discriminer par des approches géophysiques et géochimiques des zones minéralisées dissimulées dans les grands axes conducteurs.

302. CHARBONNEAU, B.W., Geol. Surv. Can.:
Evaluation of uranium reconnaissance data, 1976-.

Sees
Recognition of uranium concentration processes in granites and related rocks using airborne radiometric measurements; Geol. Surv. Can., Paper 83-1A, p. 277-284, 1983.

303. GRASTY, R.L., Geol. Surv. Can.:
Gamma-ray spectrometry (technique development), 1972-.

304. MACNAB, R.F., Geol. Surv. Can.:
East coast offshore surveys, 1973-.

Sees
The new international geomagnetic reference fields: how good are they?; Geol. Surv. Can., Paper 82-1B, p. 167, 168, 1982.

Multiparameter mapping off the east coast of Canada; Geol. Surv. Can., Paper 83-1A, p. 163-171, 1983.

Computer contouring of marine survey data: choosing the best technique for gridding input data; ibid., p. 173-178, 1983.

A fast polynomial approximation of the international geomagnetic reference fields; ibid., p. 486, 1983.

GEOMAGNETISM-PALEOMAGNETISM/ GÉOMAGNÉTISME-PALÉOMAGNÉTISME

305. BARLOW, R.B., Ontario Geol. Surv.:
Commercial aeromagnetic gradiometer system, 1981-84.

A contract to test-fly a commercial aeromagnetic gradiometer system in 1983 has been awarded to Kenting Earth Sciences Limited. The vertical magnetic gradiometer system features a novel retractable boom assembly which is tail mounted on a Piper PA-31 Navajo aircraft. Two cesium vapour magnetometer sensing heads will have a separation of approximately 2 m in the survey mode, and the lower boom will retract for airport runway maneuvers. Currently, the development work has centred on the digital acquisition system and the construction of a lightweight self-orientating sensor assembly.

306. BOWER, M.E., Geol. Surv. Can.:
Ocean aeromagnetics, 1965-.

307. BUCHAN, K.L., Geol. Surv. Can.:
Vertical movements of the Precambrian Shield, 1980-.

308. BUCHAN, K.L., Geol. Surv. Can.:
Paleomagnetism of Nipissing diabase and Abitibi dykes, Ontario and Quebec, 1982-.

309. CHRISTIE, K.W., Geol. Surv. Can.:
Paleomagnetism and rock magnetism instrumentation and technological development, 1970-.

310. CHRISTIE, K.W., Geol. Surv. Can.:
Paleomagnetism of the Hopedale diabase dykes, 1972-.

311. CURRIE, R.G., Geol. Surv. Can.:
Marine magnetic surveys, Pacific margin, 1980-.

Sees
Multiparameter geophysical survey off the west coast of Canada: 1973-1982; Geol. Surv. Can., Paper 83-1A, p. 207-212, 1983.

Computer programs to estimate wave generated orbital velocities and threhold erosion velocities; ibid., p. 253-261, 1983.

312. DEUTSCH, E.R., Memorial Univ. (Earth Sciences):
Mid-Ordovician paleomagnetism and the extent of the Proto-Atlantic Ocean, 1982-83.

Sees
Ordovician paleomagnetism and the extent of the Proto-Atlantic Ocean; EOS, vol. 63, p. 308, 1982.

Following publication of a reliable mid-Ordovician paleomagnetic result from volcanic rocks southeast of the presumed collision suture in Ireland, this has been compared with published paleomagnetic results from rocks of the same age located northwest of the suture in Ireland and in western Newfoundland and cratonic eastern North America. The British Isles data,when applied to a plate model of the Caledonides, has led to a wide Proto-Atlantic (Iapetus) Ocean relative to Ireland and a smaller ocean relative to Britain, along with a 30° rotation of the British Isles during the Ordovician. Significant discrepancies remain between the British/Irish poles (corrected for post-Paleozoic opening of the Atlantic) and the North American poles. To explain this discrepancy, the Ordovician data are further shown to be compatible with the hypothesis, recently proposed in the literature, that the British Isles underwent a 16-18° of arc sinistral transcurrent displacement in mid-Devonian to mid-Carboniferous time.

313. DEUTSCH, E.R., ÖZDEMIR, Ö., PÄTZOLD, R.R., Memorial Univ. (Earth Sciences):
Paleomagnetism and magnetostratigraphy of igneous and sedimentary drill core from offshore Labrador and Newfoundland, 1979-84.

Sees
Paleomagnetism of drill cores from Labrador offshore wells; Can. J. Earth Sci., vol. 19, p. 2210-2214, 1982.

The first paleomagnetic results from offshore Labrador, based on vertically oriented short core sections of basalt from three oil company wells are dated latest Jurassic to early Cretaceous. Alternating-field and thermal treatment revealed a stable remanence mostly of normal polarity and in one case an R-N polarity change. Virtual pole loci calculated from the paleo-inclinations agree fairly well with published Early Cretaceous poles for eastern North America.

A paleomagnetic/magnetostratigraphic study of Cretaceous (later to be extended to Jurassic and Cenozoic) sedimentary drill core from wells drilled on the Newfoundland/Labrador continental shelves, initially the Hibernia structure, is underway. The material includes weakly magnetized but presumably magnetically unaltered material (including limestones) that can be measured adequately on the University's new superconducting magnetometer. It is hoped that paleo-inclination/polarity correlations between neighbouring wells will prove possible in some cases.

314. DEUTSCH, E.R., PÄTZOLD, R.R., Memorial Univ. (Earth Sciences):
Further paleomagnetic study of the early Tertiary Cape Dyer – Cape Searle basalts, Baffin Island, Northwest Territories, 1980-83.

Sees
New early Tertiary paleomagnetic results for Baffin Island, and their bearing on the evolution of Baffin Bay; Can. Geophys. Union, 9th Ann. Meeting, Abstracts vol., p. 23, 1982.

Following a preliminary paleomagnetic study of the Cape Dyer (early Tertiary) basalts on Baffin Island, lavas from the same belt of exposures have been investigated on Durban and Padleping Islands, off Baffin Island. They gave a paleomagnetic pole of normal polarity at 79.3°N, 98.5°W ($dp,dm = 3.3°, 3.4°$, N = 33 flows). This is identical to the pole position obtained after AF treatment, or that obtained without any treatment, of the natural remanence which appears to reside in a single component of highly stable, single-domain magnetite. A 21° angular separation between this pole and a published pole for Disko, west Greenland, implies a wide Baffin Bay in the early Tertiary, assuming that the two poles are contemporaneous. Such a reconstruction poses problems of interpretation.

315. FAHRIG, W.F., Geol. Surv. Can.:
Paleomagnetism of the dykes of west Greenland, 1972-.

316. FAHRIG, W.F., Geol. Surv. Can.:
Paleomagnetism of Proterozoic to Devonian strata across Boothia Arch, 1974-.

317. HALLS, H.C., Univ. Toronto (Geology):
Paleomagnetism of the Kenora-Kabetogama dyke swarm, 1980-84.

Sees
The importance and potential of mafic dyke swarms in studies of geodynamic processes; Geoscience Canada, vol. 9, p. 145-154, 1982.

Paleomagnetic sampling has been carried out along the length (~320 km) and breadth (~100 km) of a NW-trending dyke swarm that runs from Kenora, Ontario southwards into Minnesota. At its southern end the swarm passes beneath sediments of the Animikie basin (Southwick and Day 1983) and a Rb-Sr isochron date of about 2.1 Ga (Beck and Murthy 1980) gives the time of intrusion. About 30 paleomagnetic sites, comprising more than 200 dyke and host rock samples reveal after AF demagnetization that the dykes possess a well-defined primary remanence having a direction ~(120°/-50°). Towards the southern end of the swarm the paleomagnetic signature becomes more complex, with overprints ~(310/+75°) and ~(100/+30°) being the most frequently observed. This increase in magnetic overprinting appears to be accompanied by increased alteration, considered by Southwick and Day to be of deuteric origin rather than due to paleoburial by Animikie sediments. The paleomagnetic data can be successfully used to correlate individual dykes along the length of the swarm, a preparatory step before examining any longitudinal changes in geochemistry that might reflect source direction (e.g. Halls 1982).

318. HALLS, H.C., PALMER, H.C., Univ. Toronto (Geology), Univ. Western Ontario (Geophysics):
Paleomagnetism of the Powdermill Group, Michigan and Wisconsin, 1980-84.

Forty-two paleomagnetic sites have been obtained along a strike length of about 70 km in the lower Keweenawan (~1.2 Ga) Powdermill Volcanic Group – to test the existence of the eastern arm of the Logan Loop and the presence of an asymmetric reversal (N>R) at the base of the sequence, reported by Books (1972). The Powdermill Group is about 3000 m thick at its western end where it dips ~80°N but only a few 10's of metres (dip 0>20°N) survive in the east where the flows have been subject to a period of erosion now represented by the unconformably overlying Jacobsville sandstone.

AF followed by thermal demagnetization shows that nearly all flows have a primary reversed magnetization. In the west the average direction (+80°/-65°) appears to be different from that in the east (average direction ~(110°/-60°)) so that despite semi-continuous outcrop along strike the two groups of flows may not be correlative.

Three detailed sections at the base of the volcanic pile in the west failed to reveal a reversal sequence consistent with Books' findings. One section revealed all reversed directions, another yielded the same result except that normal polarities (270/+30) were encountered about 600 m above the base of the sequence, and the third, at one of Books' localities, revealed rather scattered behaviour with directions varying between a normal one and a shallow one (230/110°) possibly a Copper Harbor overprint. It is concluded that the Powdermill Group is probably of all reversed polarity but that there may be local sills and other bodies intruded into the sequence during the succeeding epoch. The eastern arm of the Logan Loop is still to be demonstrated.

319. HALLS, H.C., SHAW, E., Univ. Toronto (Geology):
Test of regional tilting in Superior Province using paleomagnetism and structure of dyke swarms, 1982-84; M.Sc. thesis (Shaw).

A total of fifteen Northerly trending dykes from the Algoma District have been sampled along an E-W Corridor on the eastern side of Lake Superior. The aim of the project is to test whether there are systematic E-W changes in paleomagnetic direction that may reflect uplift and warping of the Superior Province around the fringes of the Lake Superior Basin. At the same time paleomagnetic data will be obtained on a major dyke swarm, that has received until now little geological attention.

Preliminary results from four sites show that the dykes possess stable paleomagnetic characteristics.

320. HODYCH, J.P., TUBRETT, M., HAYATSU, A., Memorial Univ. (Earth Sciences):
Paleomagnetism and radiometric age of probable Lower Carboniferous basalts from Avalon zone of Newfoundland and the Megashear hypothesis, 1982-84; B.S. thesis (Tubrett).

To test Kent-Opdyke Megashear hypothesis by measuring paleomagnetism and radiometric age of probable Lower Carboniferous basalts from the Avalon zone of Newfoundland.

321. JACKSON, K.C., HALLS, H.C., Univ. Toronto (Geology):
Paleomagnetism of igneous rocks of the Sverdrup Basin, Canadian Arctic Archipelago, 1982-84.

The Sverdrup Basin provides an excellent opportunity to study the relation between basin development and magmatism, since igneous rocks (mainly sills) occur not only over a large area, but also across a 10 km thick stratigraphic section. Important questions concern the identification of major fissure zones and stress-regimes as given by both sills and dykes, and their temporal and spatial relation to basin subsidence. In this study we employ mainly magnetic methods to define the phases of igneous activity and the evolution of sill emplacement, and to correlate intrusives with extrusives. Sampling was done on eastern Axel Heiberg Island in the Mesozoic depocentre of the basin: 1) south of Buchanan Lake, a homoclinally dipping sequence containing over 20 sills in a sedimentary section 4 km thick, 2) the North Maktia Anticline where Triassic sediments have been folded during the Eurekan Orogeny, and 3) a presumed Lower Cretaceous lava flow.

All sills demagnetised to date show stable behaviour typical of a primary or secondary TRM or CRM. While most sills are of normal polarity, three in the lower half of the Buchanan Lake section contained mixed and reversed polarities. This fact has important consequences for the problem of correlating sills throughout the basin. The rocks contain a Lower Cretaceous magnetisation acquired before folding, together with a magnetisation which is tentatively ascribed to effects of a regional uplift.

322. KNAPPERS, W.A., Geol. Surv. Can.:
Aeromagnetic survey: Labrador and Labrador Continental Margin, 1981-.

323. LERBEKMO, J.F., Univ. Alberta (Geology):
Magnetostratigraphy of the late Cretaceous and Paleocene of Alberta, and parts of Saskatchewan, Montana and North Dakota, 1973-83.

Magnetostratigraphy of the Maestrichtian has been completed in the Red Deer Valley and correlated with sea floor magnetic anomalies 29 through 33.

324. McGLYNN, J.C., Geol. Surv. Can.:
Paleomagnetic study of Proterozoic red beds of the western Canadian Shield, 1968-.

325. MURTHY, G.S., Memorial Univ. (Earth Sciences):
Paleomagnetic investigations of Paleozoic rocks from Newfoundland and tectonic interpretation of the results, 1976-88.

Sees
Paleomagnetism of the Deadman's Bay diabase dikes from northeastern central Newfoundland; Can. J. Earth Sci., vol. 20, p. 195-205, 1983.

Paleomagnetism of diabase dikes from the Bonavista Bay area of northeastern central Newfoundland; ibid., p. 206-216, 1983.

Magnetic granulometry results for intrusive rock samples; Nature, vol. 295, p. 688-690, 1982.

On the complex magnetic behavior of titanomagnetites; Physics of the Earth and Planetary Interiors, vol. 30, p. 281-290, 1982.

Paleomagnetism of Gander Zone rocks is being studied extensively. The diabase dikes from northeast Gander Zone yield paleopoles at 30°N, 70.7°W (DB1), 35°S, 82°W (DB2), 54°N, 77½°W (DB1), 4°S, 33½°W (DB2). The results suggest that the so called high latitude poles cannot be discounted as due to remagnetizations or rotations. Paleomagnetism of the Clam Bank Formation from western Newfoundland is being studied. A paleopole of Late Ordovician age at 29°N, 154°E and a pole of probable Devonian age at 26°N, 150°E are obtained.

326. OLSON, D.G., Geol. Surv. Can.:
High resolution aeromagnetics (experimental surveys), 1968-.

327. PRASAD, J.N., DEUTSCH, E.R., Memorial Univ. (Earth Sciences):
A paleomagnetic investigation of early Paleozoic rocks in western Newfoundland, 1982-83; Ph.D. thesis (Prasad).

A paleomagnetic study of gently dipping carbonate and sandstone formations of early Paleozoic (Lower Cambrian to mid- or Upper Ordovician) age, exposed extensively along the west coast of Newfoundland (Humber Zone), was recently begun. The study will be supplemented by measurements of isothermal and temperature-dependent rock magnetic properties. A major rock type included in the exposures sampled is magnetite-bearing marine limestone, which previous published work has frequently shown to carry a stable, though weak, primary remanent magnetization; an instrument such as the University's new superconducting magnetometer is capable of measuring such a remanence. To obtain a reliable Cambrian-to-Ordovician paleomagnetic record for platformal western Newfoundland, for comparison with paleomagneitc data of comparable age in other parts of the stable margin of eastern North America and for other land masses. In this context, it is hoped also that the results will provide some evidence on the hypothesis of a (wide) Proto-Atlantic Ocean. Initial collection of oriented samples has been carried out on the Port-au-Port Peninsula, southwestern Newfoundland, and some preliminary rock magnetic measurements have been completed.

328. READY, E.E., Geol. Surv. Can.:
Aeromagnetic survey: Gulf of Maine-Georges Bank and adjoining continental margin, 1982-.

329. SAWATZKY, P., Geol. Surv. Can.:
High resolution aeromagnetics (instrumentation development), 1977-.

330. SEGUIN, M.K., PETRYK, A.A., Québec Ministère Énergie et Ressources:
Magnetostratigraphy of the Ordovician-Silurian platform, Anticosti Island, Québec, Gulf of St-Lawrence, 1981-.

The results of the first phase of investigation of the paleomagnetism of the largely carbonate platform sequence of Anticosti Island will be published, probably in 1983, by the Canadian Journal of Earth Sciences. Special instrumentation, allowing for alternating field demagnetization, and thermal treatment, has detected valid natural remnant magnetization in silicic-clastic-bearing limestones. Preliminary results provide a basis for an alternative theoretical model to that currently held for apparent polar wandering across the Ordovician-Silurian boundary of North American. A second phase of sample analysis is in progress.

331. STUPAVASKY, M., SYMONS, D.T.A., GRAVENOR, C.P., Univ. Windsor (Geology):
(a) Paleomagnetic fold and conglomerate tests for metamorphic remagnetization of Huronian age rocks from Northern Ontario, (b) Conglomerate test on Precambrian Tillite in Scotland, 1981-84.

Sees
Penokean remagnetization of basal Huronian Dollyberry Lake basalts near Elliot Lake, Ontario; Can. J. Earth Sci., vol. 20, p. 49-56, 1983.

Evidence for metamorphic remagnetization of upper Precambrian tillite in the Dalradian Supergroup of Scotland; Trans. Royal Soc. Edinburg, Earth Sciences, vol. 73, p. 59-65, 1982.

(a) Paleomagnetic fold tests on the Huronian Firstbrook Formation from the Maple Lake-Bass Lake Syncline near Espanola, Ontario and Huronian Gordon Lake Formation from the Smoothwater Lake Syncline, Corley Township to determine the age of their magnetization relative to the folding.

(b) Paleomagnetic studies of the Huronian Gordon Lake and Bar River Formations to determine their paleomagnetic paleolatitudes and test for agreement with other sediment paleolatitude indicators.

332. SYMONS, D.T.A., Univ. Windsor (Geology):
Paleomagnetic studies of rock units in Canada, 1982-83.

Sees
Evidence for metamorphic remagnetization of upper Precambrian tillite in the Dalradian Supergroup of Scotland; Trans. Roy. Soc. Edinburgh, Earth Sciences, vol. 73, p. 59-65, 1982.

Penokean remagnetization of the basal Huronian Dollyberry Lake volcanics near Elliot Lake, Ontario; Can. J. Earth Sci., vol. 20, p. 49-56, 1983.

Magnetization characteristics of the Algoman iron formation and host rocks at the Griffith Mine, Red Lake, Ontario; Ont. Geol. Surv., Open Report, p. 19-57, 1982.

Component magnetization of Algoman iron formations and deposits in Ontario; ibid., p. 1-18, 1982.

Involves: 1) Mesozoic rock units in British Columbia emphasizing allochthonous terrane motions; and 2) Precambrian rock units in Ontario emphasizing iron ore and tillite genesis, and the location of the apparent polar wander path in Archean time.

333. WRIGHT, J.A., PAL, B.K., Memorial Univ. (Earth Sciences):
Geomagnetic depth sounding over an ancient plate margin in eastern Newfoundland, 1981-83; M.Sc. thesis (Pal).

Sees
Analogue model study of electromagnetic induction in the Newfoundland region; Physics of the Earth and Planetary Interiors, vol. 32, 1983.

A geomagnetic depth sounding survey along a profile across the Gander Belt in eastern Newfoundland has been completed. The Gander Belt marks the eastern margin of the ancient (Iapetean) proto-Atlantic Ocean in the northern Appalachians. This zone does not display the clear evidence of ophiolite emplacement that the western margin does and the main aim of the survey was to determine the structure at depth of the boundary. Eight stations were occupied at a mean station spacing of ≈15 km. Recordings were made in the frequency range 1.0 Hz to 0.01 Hz. The results of the survey are presented as induction arrows. Because of the contamination of the anomalous fields by the 'geomagnetic coast effect' analogue model data were used to 'correct' the field observations for the effect of the coastal induced variations. The difference arrows are then interpreted in terms of lithospheric structure. The interpretation of the results does not support either an eastward or westward dipping slab, but is consistent with a sub-horizontal ophiolite slab embedded in the lithosphere at a depth of about 8 km. The enhanced electrical conductivity of the slab is attributed to hydrous mineralization in the slab.

GEOTHERMAL/GÉOTHERMIQUE

334. CHURCH, B.N., YOUNG, W.M., British Columbia Ministry Energy, Mines, Petrol. Res.:
Geothermal potential map of British Columbia, 1982-83.

The geothermal potential map combines information on geothermal gradients from deep drill holes with available data on thermal springs, young volcanic centres and the geotectonic setting of the Province. The Neogene volcanic deposits of the central interior region and Devonian reef structures of the northeast are added to the map because of anticipated and the known warm water reserves of these rocks.

The sampling of geothermal gradients across the Province, determined from drill hole temperature data shows a range from low values of 13 c/km in the Lower Fraser Valley area, 22 c/km in the Nechako trough to a relatively high gradient of 42 c/km in the Fort Nelson area of the northeast. Offshore gradients range from 20 c/km in the Tofino Basin area to an average of 27 c/km in the northern Hecate Strait area.

The geothermal history of British Columbia relates to a broad tectonic framework. The principal volcanic belts are the major and most immediate sources of heat. These belts have evidently resulted from an extensive westerly drift of the continental plate over oceanic crust which itself is moving northerly to subduction in the Gulf of Alaska. The westerly directed stresses are evidently the cause and source of major east-west oriented structures such as the Anahim volcanic belt. Episodic northerly directed stresses are responsible for thrusting in the eastern Cordillera and a complicated pattern of slice tectonics in the middle and western parts accompanied by the north-south oriented Cascade and Stikine rift belts with their still hot volcanic centres.

335. PALMER, J.H.L., SVEC, O.J., National Research Council of Canada (DRB):
Ground heat storage, 1978-.

GRAVITY/GRAVITÉ

336. GODFREY, J.D., SPRENKE, K.F., LANGENBERG, C.W., Alberta Research Council (Geol. Surv.):
Geophysical aspects of the Shield in Alberta, 1960-83.

Preliminary assessment of gravity survey and aeromagnetic survey complete. Models for regional patterns of deep crustal structure and Currie surface established.

337. GUPTA, V.K., Ontario Geol. Surv.:
Gravity survey – North Bay – Sudbury – Gogama – Cobalt, Ontario, 1977-83.

Sees
Gravity and aeromagnetic studies in north-central Ontario: a progress report; Ontario Geol. Surv., Misc. Paper 106, p. 163-167, 1982.

The gravity interpretation project was continued in 1982 and was based on previous survey data covering the Cobalt Embayment-Grenville Front area. Eighteen Federal-Provincial aeromagnetic contour maps have been digitized and processed to aid interpretation of supercrustal intrusions and volcanic rocks in this area.

Several computer interpretation algorithms, including a 2½ D modelling routine, and an apparent density mapping routine, have been developed and used to interpret the residual Bouguer gravity anomalies.

338. KEATING, P., NADEAU, A., Québec Ministère Énergie et Ressources:
Levés gravimétriques entre Val d'Or et Rouyn, Québec, 1978-82.

Depuis 1978 un total d'environ 10 000 stations gravimétriques ont été établies à l'intérieur d'un périmètre comprenant les villes de Val d'Or, Amos, Normétal et Rouyn.

339. LORRAIN, P., BAZINET, R., École Polytechnique (Génie minéral):
Etude d'un gravimètre à fibre optique, 1982-85.

Développer un nouveau type de gravimètre de prospection, à la fois fiable, facile à fabriquer, de coût raisonnable et d'opération aisée.

340. MILLER, H.G., GOODACRE, A.K., PITTMAN, D.A., Memorial Univ. (Earth Sciences):
Geophysical studies of onshore-offshore correlations of Avalon Zone geology, 1980-85; B.Sc. thesis (Pittman).

Sees
Geophysical constraints on the thickness of the Holyrod Pluton, Avalon Peninsula, Newfoundland; Maritime Sediments and Atlantic Geology, vol. 18, p. 75-82, 1982.

The collection of gravity data in the Avalon Zone continued in 1982 when data were collected in Conception Bay and east of the Avalon on a joint Earth Physics Branch and Memorial University cruise on CSS Dawson. This enabled the interpretation of the northern portion of the Avalon to proceed as the major gap in Conception Bay was filled.

These data enabled us to interpret the offshore extent of the Wabana hematite deposit and to map the extent of mafic volcanic rocks beneath the sediments in the area.

Plans for 1983 are to continue offshore work south of the Avalon Peninsula and to collect gravity data onshore in the southern Avalon.

341. WILLIAMS, H., HAWORTH, R.T., Memorial Univ. (Earth Sciences):
Bouguer gravity anomaly and magnetic anomaly maps of northern Appalachians and offshore to edge of Continental Shelf, 1981-84.

Magnetic anomaly and bouguer anomaly maps at 1:2 000 000 are being prepared for the northern Appalachians and surrounding continental shelf from Long Island Sound, New York to northeastern Newfoundland.

The objective is to trace on land tectonic feature offshore across the Atlantic Margin, and compare the control or coincidence of Appalachian basement features with Mesozoic structures. A structural contour map and hopefully a pre-Mesozoic basement map are also planned for the offshore. The project was initiated because of the importance of this new petroleum frontier.

SEISMOLOGY AND PHYSICS OF INTERIOR/ SISMOLOGIE ET PHYSIQUE DE L'INTÉRIEUR DE LA TERRE

342. COOK, F.A., Univ. Calgary (Geology and Geophysics):
Reprocessing of data from a Québec seismic traverse to seek deep crustal information, 1982-84.

Knowledge of the crustal structure of Québec could be of fundamental significance to our understanding of the tecontic history of the Appalachians in particular, and mountain belts in general. Specifically, determining whether a major lower crustal transition occurs in Québec in the vicinity of observed changes in potential field anomalies (gravity and magnetics), as it appears to in other parts of the orogen, is a desired goal. If the methods employed are successful, they may be applicable to other data sets, and could therefore substantially increase our knowledge of deep crustal structure.

Seismic reflection data recorded in Québec were obtained with the VIBROSEIS (Trademark, CONOCO) technique. In this method, a frequency modulated "chirp" signal of specific time duration is utilized as the source. The length of the seismic record is then simply the difference of the total listening time (20 seconds for the Quebec data) and the chirp signal length (14 seconds). Thus, for this data set, the interpreted record length is 6 seconds (about 15-18 km depth).

By decreasing the length of the chirp signal (*i.e.*, decreasing the frequency bandwidth of the signal), a longer record length may be obtained. In the case of the Québec traverse, the bandwidth of the signal used was 58-12 HZ. Thus, the rate of change of the signal frequencies with time is (58-12)/14 HZ/sec = 3.286 HZ/sec. By changing the bandwidth to 58-12 HZ, we can acquire (25-12)/3.286 = 4 sec more of record time, giving a total record length of about 10 seconds (about 30-33 km penetration). The bandwidth can be changed on the computer by specifying the desired chirp signal.

343. GAGNE, R.M., Geol. Surv. Can.:
Shallow seismic, Atlantic offshore, 1979-.

344. GENDZWILL, D.J., PRUGGER, A., Univ. Saskatchewan (Geological Sciences):
A micro seismic monitoring system at the Cory mine, Saskatchewan, 1980-84; M.Sc. thesis (Prugger).

See:
Induced earthquakes at a potash mine near Saskatoon, Canada; Can. J. Earth Sci., vol. 19, no. 3, p. 466-475, 1982.

345. GENDZWILL, D.J., WILSON, N., Univ. Saskatchewan (Geological Sciences):
Analysis of slump structures over Winnipegosis mounds, 1983-85; M.Sc. thesis (Wilson).

346. HAMILTON, T.S., Geol. Surv. Can.:
The geology of the Strait of Georgia, British Columbia, 1982-.

See:
Evidence of seafloor instability in the south-central Strait of Georgia, British Columbia: a preliminary compilation; Geol. Surv. Can., Paper 83-1A, p. 417-421, 1983.

347. HAWORTH, R.T., Geol. Surv. Can.:
A geophysical investigation of the submarine extension of geological zonation of Newfoundland, 1974-.

348. HUNTER, J.A., Geol. Surv. Can.:
Permafrost seismic, 1973-.

See:
Mapping sub-seabottom permafrost in the Tuktoyaktuk area, Northwest Territories; Geol. Surv. Can., Paper 82-1B, p. 285, 286, 1982.

Some observations of up-hole seismic velocities and permafrost temperatures in Mackenzie Delta sediments; ibid., p. 287-290, 1982.

349. KEEN, C.E., Geol. Surv. Can.:
Seismic studies of continental margins and ocean basins of the North Atlantic, 1980-.

350. KREBES, E.S., Univ. Calgary (Geology and Geophysics):
Seismic wave propagation in a linear viscoelastic medium, 1977-.

Theoretical investigations are being carried out on the various aspects of seismic wave propagation in a layered linear viscoelastic medium. Such a medium exhibits absorption and dispersion of seismic energy, and hence is used to mathematically model the anelasticity of the earth. Detailed numerical and theoretical studies of the reflection/transmission problem are being carried out. Also, the effects of dispersion on ray tracing in a viscoelastic medium are being investigated. Current results indicate significant differences from perfect elasticity and ad-hoc theories of anelasticity in certain cases.

351. NADEAU, A., AUBERTIN, R.A., Québec Ministère Énergie et Ressources:
Evaluation de cibles Favini-Assad, Abitibi-Témiscamingue, Québec, 1980-83.

Etablir des régions-cibles à l'intérieur des lourds gravimétriques de l'Abitibi, en précisant les relations entre les gîtes minéraux et les données gravimétriques sismiques, magnéto-telluriques et autres données physiques ou géologiques disponibles.

352. NADEAU, A., LATULIPPE, M., Québec Ministère Énergie et Ressources:
Recherche de l'extension de la faille de Cadillac, Abitibi-Témiscamingue, Québec, 1982-84.

Par forages stratigraphiques et siamologie, détecter les extensions orientales de la faille de Cadillac, la structure aurifère la plus importante de l'Abitibi.

353. OVERTON, A., Geol. Surv. Can.:
Borehole geophysics (Seismic techniques), 1982-.

OTHER/AUTRE

354. DEHAM, G.M., alphaNUCLEAR Co., Ontario Geol. Surv.:
Development of portable helium detector, 1981-83.

Develop a portable man-carried instrument to measure helium levels in soil gas and natural water systems.

355. DEUTSCH, E.R., SOFFEL, H.C., Memorial Univ. (Earth Sciences), Univ. Munich:
Ferrimagnetic domain structure of synthetic titanomagnetites of variable titanium content, 1979-82.

See:
The domain structure of synthetic stoichiometric (TM10-TM73) and Al, Mg, Mn, V-doped (TM62) titanomagnetites; Phys. Earth Planet. Interiors, vol. 30, p. 336-346, 1982.

The existence of domain structure has been questioned for titanomagnetites of typical ocean basalt composition, due to their unusual temperature dependence of susceptibility. In order to make a direct test of domain structure, a series of stoichiometric titanomagnetites between magnetite (TM0) and 73% ulvöspinel content (TM73) as well as a titanomagnetite of typical ocean basalt composition have been synthesized through the double sintering technique at 1300°C, in controlled atmospheres. The domain structures were observed with the Bitter pattern technique after ionic polishing to produce stress-free surfaces. This was the first time the technique has been applied over a wide range of titanomagnetites.

Starting with magnetite, which shows a domain configuration also typical of nickel, the tendency to form lamellae-shaped domains was found to be present at compositions up to TM73 (where the Curie point is only 40°C), but with an increasing tendency to form curved domain walls and to have fewer and also differently shaped closure domains. The results are unequivocal evidence for the existence of classical-type domain structures in a broad range of stoichiometric and cation-doped titanomagnetites.

356. DODDS, J., Huntec ('70) Ltd., Ontario Geol. Surv.:
Development of a field system for reduction of geophysical data, 1982-85.

To develop a field-worthy computer system to allow on-site editing, plotting, and interpretation of geophysical data. The system design is such that many kinds of geophysical data can easily be handled by non-expert operators. Software design will permit compatibility with a wide range of computer and geophysical hardware.

357. FARVOLDEN, R.N., GREENHOUSE, J.P., KARROW, P.F., Univ. Waterloo (Earth Sciences):
Study of subsurface Quaternary stratigraphy using borehole geophysics, 1982-84.

To use borehole geophysics and continuous core (split spoon) to establish the subsurface Quaternary stratigraphy on the east flank of the Waterloo Morraine, part of the cities of Kitchener-Waterloo.

Correlation of geophysical logs using digital techniques will be attempted. Three rotary holes (logged) and one hole cored to bedrock are planned for each of the 3 year life of the program. The focus of the study will be the Greenbrook well field, for which we have considerable good subsurface data.

358. FRASER, D.C., KILTY, S., Dighem Ltd., Ontario Geol. Surv.:
Dighem IV development project, 1982-83.

To develop an omni-directional multi-frequency airborne EM system that will provide greater detection capability and better conductor sorting thereby enhancing the probability of ore discovery.

359. GRANT, F.S., PATERSON, N., Paterson, Grant and Watson Ltd., Ontario Geol. Surv.:
Development of computer software for geophysical interpretation, 1981-84.

Programming, testing and documentation of a user-oriented library of forward and inverse modelling and processing packages for advanced magnetic, EM, resistivity/IP and gravity interpretation.

360. HERZ, A., Herz Industries Ltd., Ontario Geol. Surv.:
Totem 2G - Continuous recording ground VLF EM, 1982-83.

Develop a continuous reading two station VLF EM with integral solid state data memory. The EM will be one-man-portable 'Totem' airborne VLF system, with the enhancement of Digital Microprocessing. Headings will be automatically recorded as the Operator walks, or on a periodic basis. Operator 'Notes' may be inserted into the data 'Log'. Previous Data may be recalled in field.

361. HRVOIC, I., GEM Systems Inc., Ontario Geol. Surv.:
High sensitivity portable base/station magnetometer based on overhauser effect, 1981-82.

Microprocessor controlled portable/base station high sensitivity proton magnetometer based on overhauser effect will have 0.1-gamma twice per second resolution, internal memory for data storage, digital/analog output, ability to read and correct data from other units, small size and weight.

362. JARVIS, G.T., Univ. Toronto (Geology):
The tectonic role of the lithosphere, 1982-85.

See:
Mantle convection as a boundary layer phenomenon; Geophysical J., vol. 68, p. 389-427, 1982.

Whole mantle convection and the thermal evolution of the Earth; Physics Earth and Planetary Interiors, vol. 29, p. 281-304, 1982.

Submarine rifting at mid-ocean ridges; Tectonophysics, vol. 94, p. 14, 1983.

To investigate the tectonic role of the lithosphere on two distinct but complimentary scales. On the large scale the lithosphere forms a relatively rigid upper boundary layer to mantle convection. I am currently testing the hypothesis that convection extends throughout the whole mantle by generating and analysing a catagloue of numerical solutions of two-parameter range appropriate to the whole mantle. Specific issues under investigation include: 1) boundary layer energetics, 2) influence of lithospheric rigidity both on the overall circulation and on observable surface features (such as heat flow, gravity, bathymetry and plate velocity), 3) stability of the Archean lithosphere and implications for crustal evolution during the Archean and Proterozoic, and 4) possible relationship between the time-dependence of mantle convection models at high Rayleigh numbers and the migration of plate boundaries at Earth's surface.

On a smaller scale, uplift and subsidence of continental crust is regulated by the mechanical and thermal responses of the lithosphere to loading extension and heating.

Using a combination of analytic and numerical techniques, the thermal implications of lithospheric extension is currently being studied. These studies suggest that the thermal role in basin formation has not as yet been fully explored.

363. KATSUBE, T.J., Geol. Surv. Can.:
Pore structure in crystalline rocks, 1981-.

See
Nonlinear elastic characteristics of granite rock samples from Lac du Bonnet Batholith; Geol. Surv. Can., Paper 83-1A, p. 411-416, 1983.

364. KEEN, C.E., Geol. Surv. Can.:
Rift processes and the development of passive continental margins, 1980-.

365. KILLEEN, P.G., Geol. Surv. Can.:
Borehole geophysics (nuclear techniques), 1974-.

See
Preliminary studies on gamma ray spectral logging in exploration for gold; Geol. Surv. Can., Paper 83-1A, p. 391-397, 1983.

366. LAZENBY, P.G., Questor Surveys Ltd., Ontario Geol. Surv.:
Evaluation and adaptation of LORAN-C for airborne geophysical survey, 1981-82.

To evaluate the new ONI-7000 in terms of accuracy and adaptability for survey navigation. Test surveys will be flow in several areas in Ontario and ground follow-up testing of the equipment will be carried out.

367. LAZENBY, P.G., de CARLE, R.J., Questor Surveys Ltd., Ontario Geol. Surv.:
Aeromagnetic gradient characterization of altered volcanics, Ontario, 1982-85.

The recently developed Questor high-resolution airborne magnetic gradiometer will be deployed to define the geophysical/geochemical characterization of altered volcanic belts as a function of their magnetite content and remanent magnetization. The objective will be attained through the analysis of high quality gradiometer data processed with state-of-the-art computer software.

368. LISOWSKI, M., SLAWSON, W.F., Univ. British Columbia (Geophysics and Astronomy):
Establishment and analysis of precise geodetic networks, Vancouver Island, British Columbia, 1982-84.

A trilateration network spanning a 40 km by 80 km area east of the Nootka Sound, Vancouver Island, was established by the Canadian Geodetic Survey in 1982. The network is comprised of 23 lines (24 km average length) between 9 stations. Aircraft flown meteorological profiles were used to compute refractivity corrections to measured lengths. Residuals from a variation of coordinates adjustment of the network indicate a standard deviation of 5 mm in a distance measurement. The network includes 5 stations from a 1947 second-order triangulation survey. Assuming uniform strain, 1947-1982 angle from adjusted directions yields an estimate of the mean engineering shear, γ_s of 0.7 +/-0.2μ rad/yr with the axis of maximum compression N 22°E +/-8°. Angle changes are more precisely determined than position shifts because of relatively poor scale control in the 1947 survey, thus only shear deformation is calculated. Compression in this direction is intermediate between that expected for the Pacific-North American plate motion and the Juan De Fuca – American plate motion, and is rotated slightly eastward from that indicated by focal mechanisms of strike-slip earthquakes on Vancouver Island. Additional ties to existing stations would help to elucidate deformation patterns within this seismically active area.

369. STRANGWAY, D.W., SUGIURA, N., Univ. Toronto (Geology):
Magnetic properties of extraterrestrial materials, 1977-.

Physical properties of extraterrestrial materials were investigated to elucidate the early history of the solar system. Magnetic anisotropy and porosity were good measures of strain history of chondrites. Permeability seems to be an important factor which control the volatile element contents in chondrites. Paleomagnetic investigation revealed thermal and mechanical history of chondrites. Paleomagnetic investigation of lunar rocks indicated the presence of a fairly strong magnetic field on the moon at 4 b.y. ago.

ENGINEERING GEOLOGY/GÉOLOGIE DE L'INGÉNIEUR

370. ABET, M.Y., BÉRARD, J., École Polytechnique (Génie minéral):
Etude des causes de la déformation du barrage de Beauharnois, Québec, 1983-84.

Le barrage de Beauharnois subit des déformations mécaniques que nous croyons reliées aux réactivités alcalis-silice qui se produiraient entre les grès (orthoquartzites) et les alcalis du ciment Portland. Le but de notre étude est d'établir le mécanisme de réaction.

371. DYKE, L.O., CORKNEY, L., SOURIS, M., Queen's Univ. (Geological Sciences):
Engineering properties of till, District of Keewatin, Northwest Territories, 1982-83; B.Sc. thesis (Corkney), M.Sc. thesis (Souris).

A blanket of well-graded till is the only surficial material over large areas of the District of Keewatin. Each winter ice veins and lenses form above permafrost in the till active layer. The till, on thawing, contains an excess of water over that needed for saturation and any vibratory loading produces a rapid liquifaction. On slopes or flats were drainage is poor the till usually remains capable of liquifaction throughout the summer and displays bearing capacity failures when traversed by heavy machinery. While many part of the Canadian Arctic have seen engineering and construction activity, most of these locations are at or near sea level where water-washed granular materials are available. As resource development moves to interior parts of the arctic, till may be the only unindurated construction material available. Its consolidation and permeability according to hydrologic environment is being studied in order to learn how important controlling the access of water to till as a construction material will be.

GEOTECHNIQUE/GÉOTECHNIQUE

372. EGGINTON, P.A., Geol. Surv. Can.:
Hydraulic, morphologic and morphometric studies of selected rivers along the Mackenzie Highway, 1975-.

373. GADD, N.R., Geol. Surv. Can.:
Geological variability of marine deposits, Ottawa-St. Lawrence Lowland, 1974-.

374. HEGINBOTTOM, J.A., Geol. Surv. Can.:
Slope process and cryogenic movements, Arctic Islands, 1977-.

375. HOLM, P.E., Univ. Windsor (Geology):
Strength testing of reservoir strata in the Grimsby Formation (Lower Silurian) of south-western Ontario, 1983-84.

The strength and deformational behaviour of samples from the Lower Silurian Grimsby Formation will be investigated under unconfined and confined test conditions. Samples will be selected to determine the influence of variations in lithology, degree of induration, and sedimentary structures on the deformational characteristics of the rocks, particularly where reservoir heterogeneities may be identified. The Grimsby will be studied because it is a major source of natural gas and crude oil production in south-western Ontario and the flow charcteristics of the formation are poorly understood.

Failure strength, Mohr-Coulomb type failure envelopes, and Young's moduli for the various samples will be determined. Dilatancy measurements will be made during the confined tests which will allow a value of Poisson's ratio to be determined and the volumetric strain of the samples during deformation to be analyzed. Porosity and permeability of all test samples will be measured prior to strength testing. Results of the experimental program will be discussed in relationship to the other observed and measured rock charcteristics. Improved hydrocarbon recovery and the safe possible use of the Grimsby Formation for gas storage can best be achieved if the relationships betweeen these rock properties are known.

376. HUDEC, P.P., Univ. Windsor (Geology):
Integrity of clay liners in brine pond environment, 1980-83.

Properties of some 20 different clay samples were determined. These included Atterberg limits, compaction, grain size and permeability. Permeability to brine was also determined on the same sample, following determination to water. Samples were then treated with brine, and the changes in the above properties were determined.

The results show that permeability of fresh water clay increases dramatically when brine is used as a permeating fluid. Atterberg limits show a change toward the more 'granular' soil properties.

377. HUDEC, P.P., Univ. Windsor (Geology):
Beneficiation of concrete aggregate by surface active agents, 1980-83.

Various compounds, both organic and inorganic, including amonia-based, and large cationic, polar molecules were used for treatment. The effect of the treatment was determined by measuring the amount of water adsorbed on internal rock surfaces.

The results indicate that the large, polar molecules are most effective in reducing water adsorption. Work is continuing to determine long-term effects of treatment, and changes in the durability of the aggregate.

378. HUDEC, P.P., Univ. Windsor (Geology):
Reevaluation of petrographic number, 1982-83.

Petrographic number is used by the Ministry of Transportation and Communication as a major evaluator of aggregate quality. The method consists of assigning a quality number to a rock type. The quality numbers are 1, 3, 6, and 10 for good, fair, poor, and deleterious material respectively. To determine if the quality numbers do indeed accurately reflect the durability properties of the aggregate.

Specific rock types have been subjected to a variety of durability tests and the results are statistically evaluated and related to the current quality number. The results show that some rock types have been misclassified; they also show that a rigid four-number system of quality is not warranted.

379. HUDEC, P.P. Univ. Windsor (Geology):
New aggregate durability tests – implementation, 1982-84.

New aggregate tests developed in the previous research will be implemented through extensive testing both at the University laboratories and at the Ministry of Transportation and Communication (Ontario) laboratories. The results will be statistically evaluated. Second phase of the project consists of developing computer programs to run the testing laboratories at the MTC.

380. HUDEC, P.P., MACINNIS, C., Univ. Windsor (Geological Engineering, Civil Engineering):
Microclimates on concrete surfaces, 1982-84.

The surfaces of concrete exposed to highway traffic in the winter are subjected to de-icing salts, to repeated wetting and drying, and freezing and thawing.

The research concentrates on the median barriers which are subject to splash of water, slush, and snow. The barriers have shown rapid deterioration, noted principally on the sun-exposed side. The micro-climates, in terms of temperature, moisture content and salt content of the surfaces and near surface environment of the concrete will be studied under simulated and actual conditions of use.

381. KAISER, P.K., MORGENSTERN, N.R., MALONEY, S., Univ. Alberta (Civil Engineering):
Support design of underground cavities in weak rock, 1980-83; M.Sc. thesis (Maloney).

Sees
Support design for underground cavities in weak rock, Part I (1981), Part II (1982), Part III (1983); Alberta Dept. Energy and Natural Resources.

Time dependent deformation of small tunnels, Part I (1981), Part II (1981), Part III (1983); Int. J. Rock. Mech. Min. Sci. and Geomech. (abstracts).

Deformation properties of sub-bituminous coal mass; ibid., vol. 19, 1982.

Process simulation testing of small circular tunnels in jointed rock to evaluate time-dependent tunnel behaviour in rock mass with time-dependent strength and deformation properties.

382. KONAN, G., BÉRARD, J., École Polytechnique (Génie minéral):
Etude des infiltrations d'eau dans le Métro de Montréal, Québec, 1983-84; thèse de M.Sc.A. (Konan).

Ce projet a pour but de déterminer le lien qui existe entre la topographie, la géologie, l'occupation des terres (ancienne et actuelle) et le taux d'infiltration et la nature physilo-chimique et bactériologique des eaux d'infiltration dans le Métro de Montréal.

383. MORGENSTERN, N.R., CHAN, D., Univ. Alberta (Civil Engineering):
Shear band propagation in earth materials, 1981-84; Ph.D. thesis (Chan).

Development of a finite element computational capability to simulate progressive failure associated with shear band propagation in earth materials displaying both fictional and dilatant behaviour.

384. MORGENSTERN, N.R., COLLINS, P., Univ. Alberta (Civil Engineering):
Applications of frost heave theory, 1982-83; M.Sc. thesis (Collins).

The theory of the segregation potential recently developed at the University of Alberta provides a means of coupling water flow to a freezing front, heat flow and applied stress. The theory is being applied to the problem of interaction between frost heave and response of a buried pipeline.

385. MORGENSTERN, N.R., KAISER, P.K., Univ. Alberta (Civil Engineering):
Tunnel construction in Rocky Mountains, central British Columbia, 1983-84.

Project consists of 4 tasks of which only two are funded at present. 1) TUNNEL COST EVALUATION: by application of a computer model the bit costs and estimated costs are to be compared with the real costs; an improved computer program to predict tunnel costs should result. 2) EMPIRICAL TUNNEL DESIGN: existing tunnel and rock classification systems are evaluated for 4 tunnel projects in sedimentary rock; simplified and specialized classification system is to be developed. 3) NEAR FACE PERFORMANCE: may be monitored. 4) GROUNDWATER IN TUNNELLING: may be investigated by comparison of predicted with real water inflow.

386. SEGO, D.C., Univ. Alberta (Civil Engineering):
Strength and deformation behaviour of frozen saline sand, 1980-83.

Sees
Proc. 3rd Internat. Symp. Ground Freezing, 1982.

The influence of both strainnate and confining pressure on the strength and deformation of frozen sand with saline pore fluid is being evaluated. The salinity of the pore fluid is being varied over a wide range to establish how it also affects the frozen sand behaviour.

387. SEGO, D.C., MORGENSTERN, N.R., WITTEBOLLE, R.J., Univ. Alberta (Civil Engineering):
Geotechnical behaviour of sand containing gas hydrate – Phase 1, 1982.

The aim of Phase 1 was to develop equipment which will allow gas hydrates to form within a sand, to study the formation, and then to evaluate preliminary strength and deformation properties of the sand containing the gas hydrate. The deformation behaviour of the sand during decomposition of the gas hydrate was also to be studied.

388. SEGO, D.C., WITTEBOLLE, R.J., Univ. Alberta (Civil Engineering):
Strength and deformation behaviour of glacial till, 1981-83; M.Sc. thesis (Wittebolle).

The strength and deformation behaviour of glacial tills from both Nipawin, Saskatchewan and Edmonton, Alberta were evaluated. The micro-soil structure of each till was examined using a Scanning Electron Microscope to evaluate if the different in behaviour was due to particle arrangement or soil structure.

389. THOMSON, S., Univ. Alberta (Civil Engineering):
Pleistocene stratigraphy and geologic history of deposits, University of Alberta campus, Edmonton, Alberta, 1982-.

Subsurface stratigraphy in the University of Alberta campus, Edmonton has been plotted from numerous borehole logs and sections have been drawn. In the future, isopach maps of the various strata will be prepared and a model for the depositional environment and sequence of glacial events will be proposed. The geotechnical properties will be analysed.

390. THOMSON, S., CHU, C., Univ. Alberta (Civil Engineering):
Finite element analysis of the Edgerton Landslide, 1982-83; M.Sc. thesis (Chu).

To continue research into 'delayed failures'.

391. THOMSON, S., MORGENSTERN, N.R., Univ. Alberta (Civil Engineering):
Distribution of landslides along rivers in Alberta, 1972-.

Studies are in progress to assess slope stability for towns and cities along major rivers in Alberta.

392. THOMSON, S., MORGENSTERN, N.R., CRUDEN, D.M., Univ. Alberta (Civil Engineering):
Investigation of the mechanics of Ice Shoved bedrock, 1980-.

To investigate the mechanism of ice shoving of the Upper Cretaceous bedrock and assess the engineering implications with regard to strength characteristics of the deformed rock.

393. THOMSON, S., SEGO, D.C., SCOTT, D., GALE, A., Univ. Alberta (Civil Engineering):
Settlement of mine tailings backfill in open pit mining, 1982-.

Assess time rates and seats of backfill settlement; assess capacity of reclaimed areas for foundations of light structures and differential settlement of utilities.

PERMAFROST/PERGÉLISOL

394. BAKER, T.H.W., National Research Council of Canada (DRB):
Physical and mechanical properties of frozen ground, 1971-85.

Sees
Locating the frozen/unfrozen interface in soils using time-domain reflectometry; Can. Geotechnical J., vol. 19, no. 4, p. 511-516, 1982.

395. DESROCHERS, D.T., FRENCH, H.M., Univ. Ottawa (Geography):
Permafrost and its relationship to Late Quaternary history, High Arctic Islands, 1981-83; M.A. thesis (Desrochers).

Sees
A review on the geology, geomorphology and glaciation of the Sabine Peninsula of Melville Island, N.W.T.; Geoscope, vol. 13, no. 2, p. 41-54, 1983.

The study focusses on the relationship between various permafrost thicknesses observed in the High Arctic Islands and the Quaternary history of each area. The specific aims are: 1) to assess whether permafrost thicknesses below the marine limit are related to the time since emergence; 2) to establish whether there is a relationship between permafrost thickness and distance from the shoreline; and 3) to investigate whether different permafrost thicknesses are controlled by geomorphic histories and/or thermal properties of rock material.

Particular emphasis is directed to: 1) permafrost thicknesses and temperatures at wellsites near the present shoreline and

others near the inferred maximum marine limit; 2) the types of surficial deposits, geomorphic features and inferred Late Quaternary histories of the various localities; and 3) the determination of thermal conductivities from drill cuttings taken from geologic formations representative of the Sverdrup Basin (Cretaceous rocks of the Sabine Peninsula of Melville Island).

396. DRAKE, J.J., WOO, M.K., ROULET, N., McMILLAN, B., McMaster Univ. (Geography):
Modelling the impact of uranium mining tailings on the permafrost environment, 1981-84; Ph.D. thesis (Roulet), M.Sc. thesis (McMillan).

To produce a computer model to predict the changes in active layer regime consequent upon the emplacement of uranium mining tailings. This will include models of supra-permafrost groundwater influences and of the response of a wetland hydrologic system to changing parameters.

397. FRENCH, H.M., POLLARD, W.H., DESROCHERS, D.T., Univ. Ottawa, (Geography):
Permafrost and geomorphic process studies, Banks Island and related areas, Western Arctic/High Arctic islands, 1968-; Ph.D. thesis (Pollard).

Seen

Ground ice stratigraphy and Late Quaternary events, southwest Banks Island; Proc. Fourth Canadian Permafrost Conf., p. 81-90, 1982.

The hydrology of small run-off plots in an area of continuous permafrost, Banks Island; ibid., p. 151-162, 1982.

Downslope water movement and solute concentrations within the active layer, Banks Island; ibid., p. 163-172, 1982.

Research is planned for 1983 and 1984 on southern Banks Island, investigating permafrost and ground ice conditions and in the interior Yukon (Ogilvie Mountains), with studies on seasonal frost mounds.

398. GOODRICH, L.E., JOHNSTON, G.H., PENNER, E., National Research Council of Canada (DRB):
Ground thermal regime, 1970-.

Seen

Influence of snow cover on the ground thermal regime; Can. Geotechnical J., vol. 19, no. 4, p. 421-431, 1982.

399. JOHNSTON, G.H., National Research Council of Canada (DRB):
Field observations of performance of foundations of buildings, bridges, roads, airfields, utilities, etc., 1950-.

Seen

Permafrost – Engineering design and construction; G.H. Johnson (Ed.), John Wiley and Sons Canada Limited, Toronto, Ontario, 1982.

400. JOHNSTON, G.H., GOODRICH, L.E., National Research Council of Canada (DRB):
Insulated embankments of permafrost, 1972-83.

401. JONES, S.J., JOHARI, G.P., Environment Canada (National Hydrology Res. Instit.):
Mechanical properties of gas hydrates, 1983-85.

To investigate the elastic and plastic properties of tetrahydrofuran as a model for methane hydrate and to determine its fracture strength.

402. PARAMESWARAN, V.R., National Research Council of Canada (DRB):
1) Physical and mechanical properties of frozen soils. 2) Model studies of foundations in frozen ground, 1975-.

Seen

Strength and deformation of frozen saturated sand at -30°C; Can. Geotechnical J., vol. 19, no. 1, p. 106-107, 1982.

Electrical freezing potentials in water and soils; Proc. Internat. Symp. on Ground Freezing, Hanover, 1982.

403. POLLARD, W.H., FRENCH, H.M., Univ. Ottawa (Geography):
An investigation of seasonal frost mounds in the interior northern Yukon, 1979-83; Ph.D. thesis (Pollard).

Seen

An investigation of seasonal frost mounds in the North Fork Pass area, interior northern Yukon Territory; Geoscope, vol. 13, no. 2, p. 11-24, 1983.

Between 1980 and 1982 a total of 65 seasonal frost mounds were observed at several localities in the North Fork Pass, interior northern Yukon. The majority were of the frost blister variety, although icing blisters and icing mounds also occurred. The largest was 3.5 m high. Several persisted for more than one year and a few experienced re-activation and further growth in a second winter. Stratigraphic investigations, together with ice fabric and isotope analyses, suggest the mounds result from the freezing of suprapermafrost groundwaters during winter freezeback under conditions of high hydraulic potential. Piezometers, installed in areas of active mound formation, indicate pressures ranging from 40-80 kPa are associated with mounds 1-2 m high.

ROCK MECHANICS/MÉCHANIQUE DES ROCHES

404. CRUDEN, D.M., Univ. Alberta (Geology):
Stability of natural slopes in rock, western Canada, 1971-.

Seen

The Brazeau Lake Slide; Can. J. Earth Sci., vol. 19, p. 975-981, 1982.

Detailed mapping of selected sites at which large downslope movements in rock are occurring, or have occurred, has continued. Laboratory work has provided a theoretical basis for these studies.

405. DAS, B., EMR (CANMET):
Rock properties of coal measures rock in the Rocky Mountain Foothills, 1982-83.

406. DUSSEAULT, M.B., UNRAU, J., Univ. Waterloo (Earth Sciences):
Time-dependent behavior of potash ore, New Brunswick, 1982-85.

To develop constitutive laws for polyaxial stress states in potash; to separate the effects of deviatoric stress and hydrostatic stress on creep rates; to correlate laboratory data directly to prototype mine behavior; and to rationalize and improve mine design so that recovery factors can be maximized.

407. EISBACHER, G.H., Geol. Surv. Can.:
Study of large landslides in the Western Cordillera, 1976-.

408. EVANS, S., CRUDEN, D.M., Univ. Alberta (Geology):
Landslides in the Kamloops Group in south-central British Columbia, 1977-83; Ph.D. thesis (Evans).

To rationalize the regional distribution of landslides in the volcanic rocks of the Kamloops Group in south-central British Columbia; to determine the failure mode and mechanics of selected landslides in the Kamloops Group; to isolate the factors contributing to slope failure in the Kamloops Group; and to formulate a landslide slope development model for the Kamloops volcanics in south-central British Columbia for use as an indicator of potential natural hazards.

409. FISEKCI, M.Y., CHRZANOWSKI, A., EMR (CANMET):
Development of surface subsidence monitoring by means laser, computerized-telemetry and aerial photogrammetry for thick and steep coal seam mining in the Rocky Mountain region, 1983.

Seen

Some aspects of subsidence monitoring in difficult terrain and climate conditions of Rocky Mountains, Western Canada; Proc. U.S. workshop on surface subsidence due to underground mining, 1982.

Telemetric monitoring of ground subsidence; Proc. 5th Internat. Symp. Mine Surveying, 1982.

To conduct research leading to the development of a rationale for designing and evaluating the stability of underground coal mines in difficult thick and steep seams of Rocky Mountains; and to achieve the aims of improved safety and efficiency of existing mining system while simultaneously developing new systems that are inherently safer, higher recovery, more productive and compatible with the difficult geological environment.

CANMET developed, through both joint with industry and contract research, an unique remote sensing (computerized radio telemetry and laser measurements) ground based system for measuring subsidence-induced surface movements and has coupled this with aerial photogrammetry. The two systems were compared and validated during a two year experimental program to the point where the aerial system was capable of determining surface movements of ±8 cm. Ground control and subsidence guidelines for thick and steep seams are under preparation for presentation at seminars and workshop, October 1983.

410. GYENGE, M., SHIMOTANI, T., EMR (CANMET):
Rock properties and support systems, 1980-.

Seen

Laboratory test for post-failure strength properties of rocks; MRL 82-33 (TR), CANMET, 1982.

Strength determination of rocks at Copper Cliff South Mine; MRL 82-8 (TR), CANMET, 1982.

Equipment and a methodology has now been developed to use a non-stiff standard testing machine to stiff test brittle rock materials (Class II) and will be reported on shortly. Studies are proceeding with the development of the methodology to treat soft rock materials (Class I), preparatory to use on Cape Breton coal measure rocks.

Present rock bolting practices have been reviewed. Studies involving the parametric analysis of the factors related to bolt design, installation and monitoring have been carried out. A final draft of a publication on bolting guidelines for hard rock is anticipated for March 1984.

411. HEDLEY, D.G.F., MACDONALD, P., HERGET, G., EMR (CANMET):
Mine and regional stability, 1980-.

Field tests have been completed using two instrumented stopes at Elliot Lake to investigate the effectiveness of several monitoring systems to detect roof falls. Results are now being analyzed.

Microseismic systems have been installed at Algoma Ore Properties, Wawa, Ontario and in adjacent areas of two Ellio Lake Mines

(Quirke and Denison Mines). Their effectiveness in locating areas of instability and the onset of instability will be investigated.

Other applied ground control studies will be directed at evaluating a rock stress monitor unit, pillar orientation and drift location on stability and analytic studies on the effect of faults and dykes on stability.

412. LAROCQUE, G.E., MIRKOVICH, V., ANNOR, A.B., EMR (CANMET):
Underground nuclear waste repository, 1977-85.

Sees:
Measurement of thermal diffusivity of rocks at high pressure; Proc. 8th European Thermophysics Properties Conf., 1982.

Nonlinear elastic characteristics of granite rock samples from Lac du Bonnet Batholith; Geol. Surv. Can., Paper 83-1A, p. 411-416, 1983.

Compilation of thermal/mechanical data for two research areas is presently underway. It is planned to have available standard reference data for use in all analytical studies associated with nuclear waste disposal.

Physical property studies are to start on rock specimens from a new research area constituting a gabbroic pluton.

With regard to the underground research laboratory or the Lac du Bonnet batholith, specialized path dependent tests are planned to meet specific modellers needs. As well, under contract, TerraTek (Barton) is to develop a methodology to describe the mechanical/hydraulic behaviour of joints under deep vault conditions.

413. NYLAND, E., DUSSEAULT, M.B., Univ. Alberta (Geophysics), Univ. Waterloo (Earth Sciences):
Microseismic monitoring of in situ processes, 1982.

Sees:
Fireflood microseismic monitoring; results and potential for process control; Petrol. Soc. CIM, Ann. Tech. Meeting, 1982.

Fireflood microseismic monitoring: rock mechanics implications; 23rd Symp. Rock Mechanics, Berkeley, Calif., Ch 104, p. 1065-1076, 1982.

Development of appropriately designed down-hole transducers for further development of the technology; to continue to develop the technique as a means of monitoring to increase hydrocarbon recovery; to explore the concept as a means of developing earthquake theory, using firefloods as a controlled source model; and to develop capability.

414. PALMER, J.H.L., National Research Council of Canada (DRB):
Field performance of tunnels under conditions of high in situ stress, 1976-.

415. TSUI, P.C.W., CRUDEN, D.M., Univ. Alberta (Geology):
Structures in the Salt River escarpment, Wood Buffalo Park, Alberta-Northwest Territories, 1981-83; M.Sc. thesis (Tsui).

Sees:
A collapse doline in Wood Buffalo Park; Bull. Internat. Assoc. Engineering Geol., vol. 24, p. 87-90, 1982.

The contact between the Keg River and Chinchaga formations has been mapped in Wood Buffalo National Park. It has been deformed by normal faulting, by gypsum diapirs and by collapse dolines.

416. YU, Y., TOEWS, N., EMR (CANMET):
Modelling, 1980-.

A Mintab user's manual will be available to industry this year. Research will be directed towards development of new 3-D numerical procedures for stress analysis in mine applications. Analytic studies will be carried out related to planned field measurement studies of subsidence in the Sydney coal field.

SOIL MECHANICS/MÉCHANIQUE DES SOLS

417. HUGHES, O.L., Geol. Surv. Can.:
Surficial geology and land classification, Mackenzie Valley Transportation Corridor, 1971-.

418. KAISER, P.K., Univ. Alberta (Civil Engineering):
Tunnels and shafts in till (support performance), 1983-84; M.Sc. thesis.

Two projects will be instrumented. 1) a circular machine excavated tunnel in glacial deposit (till) will be instrumented to determine support load and ground deformation variability along the axis of the tunnel. A new technique to determine loads from lagging deflection will be tested. 2) a circular shaft in slightly cohesive sand will be instrumented to investigate both load and displacement development during hand excavation and support with liner plates. After construction of the manhole, the steel liner plates will be removed and the shaft performance will be recorded during compression of the sand backfill. Both field measurements will be used to develop the concept of convergence-confinement curves to a useful design method.

419. LAW, K.T., BOZOZUK, M., EDEN, W.J., National Research Council of Canada (DRB):
Geotechnical properties – Eastern marine clay, 1951-.

Sees:
Effects of soil disturbance in pressuremeter tests; Conf. on Updating Subsurface Sampling of Soils and Rocks and their Insitu Testing, Engineering Foundation Conf. Santa Barbara, CA., 1982.

420. PENNER, E., National Research Council of Canada (DRB):
Frost action in soils, 1953-.

Sees:
Aspects of ice lens formation; Proc. 3rd Internat. Symp on Ground Freezing, Hanover, NH, p. 239-245, 1982.

SNOW AND ICE/ NEIGE ET GLACE

421. FREDERKING, R.M.W., SINHA, N.K., National Research Council of Canada (DRB):
Ice mechanics, 1960-.

Sees:
On measuring flexural properties of ice using cantilever beams; Proc. Symp. on Applied Glaciology, Hanover, N.H., 1982.

422. SCHAERER, P.A., McCLUNG, D.M., National Research Council of Canada (DRB):
Avalanche engineering, 1966-.

GLACIOLOGY/GLACIOLOGIE

423. ARNOLD, K.C., Environment Canada (National Hydrology Res. Instit.):
Photogrammetric applications to glacier research and water supply from glacierized basins, 1978-82.

Sees:
Ice ablation measured by stakes and terrestrial photogrammetry – a comparison on the lower part of the White Glacier; National Hydrology Res. Instit. Paper No. 19, 1983.

A report on the application of photogrammetric techniques to the determination of mass balance for an Arctic glacier was published jointly with McGill University: the final report in the Axel Heiberg Island Research Report series. Plans to do further experiments on temperate, alpine glaciers have been cancelled and this project terminated.

424. JONES, S.J., CHEW, H.A.M., Environment Canada (National Hydrology Res. Instit.):
Mechanical properties of ice and permafrost, 1980-83.

Sees:
The confined compressive strength of polycrystalline ice; J. Glaciology, vol. 28, no. 98, p. 171-177, 1982.

Confined compressive tests on polycrystalline ice have been completed at -10°C. It is intended to repeat the work at lower and higher temperatures. Triaxial testing of saturated frozen sand has been completed and the effect of varying the amount of sand in the frozen sand/ice mixture is being studied.

425. KOERNER, R.M., FISHER, D.A., ALT, B., PARNANDI, M., BOURGEOIS, J., LANGLEY, K., Polar Continental Shelf Porject (EMR):
Paleoclimate of Arctic Islands.

Sees:
Acid snow in the Canadian High Arctic; Nature, vol. 295, p. 137-140, 1982.

Effect of wind scouring on climatic records from ice-core oxygen isotope studies; Nature, vol. 301, p. 205-209, 1983.

Carbon-14 production compared to oxygen isotope records from Camp Century, Greenland and Devon Island, Canada; Climatic Change, vol. 4, p. 419-426, 1982.

Paleoclimate of Arctic Islands from study of surface-to-bedrock ice cores from ice sheets continues. Mass balance of 4 ice caps remeasured. Synoptic climatology of Arctic Islands in terms of ice core paleoclimate is being studied. Modelling of glacier flow and temperature continues. Study of pollen concentration in N. Ellesmere ice core nears completion. Work on Holocene part of Agassiz ice cap core complete and published. Paper on pre-Holocene ice of same core almost completed. Review of ice sheet/bedrock relationship for nuclear waste disposal on Canadian Shield completed. New studies underway: 1) modelling of pre-Holocene Arctic Island ice sheet; 2) source-to-site dynamics of water vapour oxygen isotopes; 3) glacial geology – oxygen isotope records and their reconciliation; 4) modern pollen rain in Arctic islands by collection of 5 yr. ice cores.

426. MOKIEVSKY-ZUBOK, O., Environment Canada (National Hydrology Res. Instit.):
Water management of glacierized basins, 1968-.

Mass balance studies were continued on 3 representative glaciers in the 106 km² Iskut River basin. The vertical height loss of ice on the Yuri and Alexander glaciers was 2.1 m and 3.1 m respectively. On Andrei Glacier it was 4.1 m and the glacier retreated 19.5 m. All three glaciers had negative mass balances. Observations were continued on the glacier-dammed Flood and Natavas lakes in the Stikine and Iskut river watersheds. Flood Lake was filled to capacity (approx. 200 x 10^6 m^3) and discharged partially twice during August. Studies to determine mass balance and glacier melt contribution of the Tiedemann and Bench glaciers to flow regimes downstream entered their second year. Vertical ice losses were 7.2 m and 4.4 m respectively at the snouts and both had negative balances. Investigations continued on the Bridge River glaciers in order to determine the effect of the glaciers on basin runoff and to evaluate seasonal and operational forecast models in conjunction with J.R. Gordon of BC Hydro. A data collection platform (DCP) provided hydro-met data. Measurements of winter and summer balances, meteorological variables and meltwater flow continued on Sentinel and Place glaciers with mass balance only being measured on Helm Glacier. Sentinel Glacier appears to have a positive balance whilst the other two have negative balances. Since 1979 Sentinel Glacier has retreated 24 m.

427. OMMANNEY, C.S.L., CLARKSON, J.W., Environment Canada (National Hydrology Res. Instit.):
Snow and ice information and data systems, 1968-83.

Sees
Bibliography of Canadian Glaciology, 1982 – Bibliography No. 2/Ellesmere Island glaciers and ice shelves; IWD Rept. Ser. No. 58, National Hydrology Res. Instit., 1982.

Bibliography of Canadian Glaciology, 1982 – Bibliography No. 3/Ice islands of the Arctic Ocean; IWD Rept. Ser. No. 73, National Hydrology Res. Instit., 1982.

Toponymic recognition for glaciologist Fritz Muller; Canoma, vol. 8, no. 1, p. 42-43, 1982.

With support made available through the Federal Government's Summer Canada programme, the glacier inventory of the Stikine River basin was undertaken in 1982. At year's end, some 6,500 glaciers had been inventoried and the data obtained from the maps and aerial photographs keypunched; this included data compiled in 1981 for the Iskut River basin. The data set is the standard Canadian glacier inventory one with the addition of the area of ice cover within 100 m elevation bands for each glacier. Work continues on the five remaining basins in the Iskut River basin and four in the Stikine for which resource materials still have to be obtained. The basin designations are based on those of the Water Survey of Canada.

428. PERLA, R.I., Environment Canada (National Hydrology Res. Instit.):
Hydrology of the mountain snowpack, 1979-84.

Sees
The remarkable snow crystal; *Avalanche Review*, vol. 1, no. 4, 1983.

Preparation of section planes in snow specimens; *J. Glaciology*, vol. 20, no. 98, p. 199-204, 1982.

The shear strength index of spline snow; *Cold Regions Science and Engineering*, vol. 6, p. 11-20, 1983.

To understand the transport of water through mountain snowpacks and study the changes in snow texture induced by the transport and their influence on transport. Techniques for rapid preparations of plane sections in snow specimens were developed preliminary to a study of snow metamorphism, now in progress. Numerical models for computing avalanche speed and runout distance were tested in cooperation with the Norwegian Geotechnical Institute, Oslo, and the Water Survey of Canada.

429. POWER, J.M., Environment Canada (National Hydrology Res. Instit.):
Peyto Glacier hydrology, 1965-.

Sees
Estimate of glacier ablation under a debris layer from surface temperature and meteorological variables; J. Glaciology, vol. 28, no. 98, p. 29-34, 1982.

An operational Net Shortwave Radiation Model for glacier basins; Water Res. Res., vol. 18, no. 2, p. 220-230, 1982.

Hydrological relationships in a glacierized mountain basin; Proc. Symp. on Hydrological Aspects of Alpine and High Mountain Areas, IAHS Publ. No. 138, p. 51-59, 1982.

Monitoring of glaciology, hydrology and meteorology continued under contract to P.G. Johnson, Ottawa University. D.N. Collins of Manchester University conducted geochemical testing of the meltwaters to determine their sources, and to better understand the internal drainage of the glacier.

HYDROGEOLOGY/HYDROGÉOLOGIE

430. CHIN, V., TURNER, M.E., MILLER, J.A., DONOHUE, D., Ontario Ministry Environment (Water Resources Br.):
Water resources inventory studies in drainage basins in Ontario, 1964-.

The draft report for the Humber-Don River Basin has been completed and work is currently proceeding on the draft report for the Credit River drainage basin.

431. DRAKE, J.J., McMaster Univ. (Geography):
Analysis of carbonate erosion rates, 1980-.

To estimate the effects of various factors on the erosion rates of carbonate terrains around the world. To date the effects of mean climate, surficial materials and seasonality of temperature and recharge have been investigated.

432. FARVOLDEN, R.N., KARROW, P.F., GREENHOUSE, J.P., PETRIE, J., LOTIMER, A., van EVERDINGEN, D., PEHME, P., Univ. Waterloo (Earth Sciences):
Evaluation of Laurel Creek aquifer (Petrie); Evaluation of surficial aquifer at Greenbrook (van Everdingen); Hydraulics of the Greenbrook system using depth-pressure curves (Lotimer); Borehole logging (Pehme), 1982-84; M.Sc. thesis (Petrie, Lotimer, van Everdingen, Pehme).

1) Greenhouse, Karrow and Farvolden have just completed year one of a project on borehole geophysics for stratigraphic studies of Quaternary sediments in Waterloo Region. We drilled and logged 3 holes to bedrock and cored one hole to 172 ft. Each year for the next two years we plan another section using the same techniques. Our aim is to tie the subsurface units in well fields, to the exposed and described sections on the river.

2) Latimer has installed a multilevel piezometer in the Greenbrook Well field to get depth pressure curves throughout the groundwater reservoir during both pumping and recovery. The installation has 28 measurig points! All but 3 are working. We plan another installation this summer. The purpose is to determine whether or not there are gradients across confining strata.

3) Petrie and van Everdingen are both starting studies on aquifer evaluation. The source of naturally occurring dissolved solids will be examined in north Waterloo (Petrie) and the shallow aquifer will be examined in south-central Kitchener (van Everdingen).

433. FORD, D.C., BAKALOWICZ, M.J., McMaster Univ. (Geography):
Aspects of the evolution of Wind and Jewel Caves, South Dakota, and of secondary precipitates within them, 1981-83.

434. FORSTER, C.B., SMITH, J.L., Univ. British Columbia (Geological Sciences):
Hydrologic factors in an exploration strategy for geothermal resources in the Coast Mountains of British Columbia, 1982-85; Ph.D. thesis (Forster).

Exploitation of high-temperature geothermal systems holds promise as an alternative energy resource in British Columbia. Regions which have the greatest potential for geothermal energy development lie within recent volcanic belts occurring along the western edge of the province. The resource potential of several geothermal prospects is currently being evaluated and it is anticipated that other potential sites remain to be discovered. Unfortunately, resource development has been slow, in large part due to the complex physiographic and hydrogeologic conditions existing in the Coast Range Mountains. This region is characterized by high topographic relief and considerable precipitation. In addition, geothermal fluids migrate through discrete fracture network within the rock mass. Infiltration of snowmelt and rainfall in a recharge area and subsequent movement of groundwater to a fractured geothermal reservoir is a complex process which is poorly understood at present.

To develop a better understanding of the interdependence of fluid flow and subsurface temperature distribution in a potential geothermal resource area characterized by high topographic relief, considerable precipitation and groundwater flow through fractured rock, and to test our understanding of such system using data sets available from geothermal areas in British Columbia to develop hydrologic guidelines for geothermal resource development in British Columbia.

435. GRAHAM, B.W., JACKSON, R.E., BÉLANGER, D., BARBASH, J., BAHR, J., Environment Canada (National Hydrology Res. Instit.), Univ. Waterloo (Earth Sciences):
Hydrogeochemistry of toxic contaminants at the Gloucester special waste disposal site, 1980-86; M.Sc. theses (Bélanger, Barbash), Ph.D. thesis (Bahr).

A major program of field work has been completed such that contaminant migration from the site is now being mapped and predicted, contaminant attenuation studied and remedial measures developed. It is now

clear that a variety of toxic organic chemicals (e.g. benzene, toluene, chloroform, ethylether and other priority organic pollutants) are migrating away from the site towards several industrial wells approximately 600 metres distant. These wells will be contaminated within 10 years.

During 1983 research efforts will concentrate on: 1) completing the hydrogeological analysis of the site including predictions of contaminant migration towards the nearby water-supply wells; 2) developing methods for the sampling and analysis of contaminated groundwaters and aquifer materials, in particular for volatile organics, total organic halogen, dioxins and furans, and organo-metalics; 3) undertaking preliminary experiments to determine the partitioning of toxic organics and metals between aquifer sediments and groundwater in order to evaluate the retardation of contaminants relative to the velocity of the transporting groundwater; and 4) testing, by field and laboratory experiments, potential remedial technologies.

436. HUGHES, G.M., Ontario Ministry Environment (Water Resources Br.):
Field measurement of infiltration through landfill covers, Ontario, 1982-.

437. HUGHES, G.M., GOODWIN, M., McCLENAGHAN, W.A., PAWLOWSKI, I.P., Ontario Ministry Environment (Water Resources Br.):
Groundwater quality investigations; special site assessments; legislation for water-well management, 1965-.

438. LIEBSCHER, H.M., Environment Canada (National Hydrology Res. Instit.):
Groundwater pesticide contamination, Osoyoos, British Columbia, 1981-84.

Goals: to determine the extent of pesticide contamination of groundwaters in vicinity of Osoyoos Lake; to quantitatively determine groundwater inflow to Osoyoos Lake; to determine pesticide contamination of Osoyoos Lake resulting from groundwater inflow; to test field equipment suitable for collecting pesticides in groundwater; and to determine health risk of local groundwater users.

Sampling groundwater along the shoreline indicates that trace quantities of Heptachlor, Botran, PCP, 2,4 D and other pesticides are discharging into the lake. Nutrient discharge to the lake originates primarily from urban rather than agricultural areas. Project work this summary 1983 includes additional pesticides nutrient and flow monitoring.

439. MAATHUIS, H., Saskatchewan Research Council (Geology):
SRC observation wells in Saskatchewan, Canada: analysis of hydrographs, 1981-84.

Analysis of hydrographs from 49 groundwater level observation wells in Saskatchewan. Analyses include detailed investigation of seasonal and long-term trends, barometric and earth tide effects. Main emphasis will be on relationship long-term trend and climatic variability.

440. MASE, C.W., SMITH, J.L., Univ. British Columbia (Geological Sciences):
Role of shear-strain heating and pore-fluid pressures in the physics of shear zone processes, 1982-84; Ph.D. thesis (Mase).

The expansion of pore fluids by shear-strain heating might have an important effect on the cohesion and shear strength of shear zone material and, thereby, exert a controlling influence on deformation processes across the zone. The response of pore-fluid pressures within a shear zone to thermal loading caused by slip across the zone can best be described by two limiting cases. If the permeability of the shear zone is large, then the expansion of pore fluids can be easily accomodated by the rapid movement of fluid from the zone. In this case the pore-fluid pressure and dynamic shear strength remain essentially constant. If, however, the permeability is small a heating process can be considered as taking place at constant fluid mass and the fluid pressure will increase. This thermal pressurization causes the effective stress to decrease in compression, thereby promoting inelastic deformation mechanisms. If fluid pressures approach lithostatic values the dynamic shear strength will become small, and the shear zone will loose cohesion and deform as if it were a viscous solid. The objectives of this research is to develop a model of the process based on coupled equations of heat transfer, fluid flow and stress equilibrium, and then use this model to place quantitative estimates on the controlling parameters.

441. NOVAKOWSKI, K.S., RAVEN, K.G., FLAVELLE, P.A., Environment Canada (National Hydrology Res. Instit.):
Radionuclide transport and hydraulic testing in fractured crystalline rock, 1981-84.

To determine the physical and chemical controls on radionuclide transport through fractured crystalline rock by groundwater circulation. In particular, attention will be focussed on developing and assessing field methods which can be used to measure the governing mass transport parameters of fractured rock in-situ. Considerable effort will be directed toward determining the utility of these methods in characterizing the transport properties of increasingly larger volumes of fractured rock.

442. RAVEN, K.G., NOVAKOWSKI, K.S., SMEDLEY, J.A., Environment Canada (National Hydrology Res. Instit.):
Chalk River nuclear laboratories groundwater flow study, 1981-84.

To define with existing and developing new field borehole investigative tools, the physical and chemical hydrogeology of a fractured crystalline rock mass measuring 200 m x 175 m at surface by 50 metres deep. In particular, attention is focussing on the problem of flow pattern defintion in a fractured crystalline rock and the usefulness of various investigative tools in defining and predicting flow in fractured media. Specific areas of interest include: validity of interference test derived inter-well hydraulic paramaters in describing rock mass transmissivity and storativity, and the ability of existing numerical models (both deterministic and stochastic) to predict groundwater flow patterns based upon surface and borehole derived input data.

443. SCHREINER, B.T. Saskatchewan Research Council (Geology):
Groundwater resource evaluation of southern Saskatchewan, 1983-.

The project will consist of mapping bedrock, buried valley, intertill, and surficial aquifers. A series of maps will delinate the areal extent and thickness of the aquifer and overlying deposits. Cross-sections will illustrate the stratigraphic position and interrelationship of the aquifers. Water levels, quality, flow directions and other hydrologic parameters will be shown. A preliminary evaluation of groundwater resources in terms of quantity and quality may be included. This work will be based on existing information supplemented by field investigations.

Initially, the project will commence with delineating and evaluating the groundwater resources in the Saskatoon area (73B) to be followed up by work in the Melville (62L-K) and North Battleford areas (73C).

444. SCHWARCZ, H.P., FORD, D.C., LATHAM, A.G., McMaster Univ. (Geology, Geography):
Age determinations and paleoenvironmental analysis of calcite speleothems, 1967-.

Sees
The paleomagnetism and U/Th dating of three Canadian speleothems; Canadian, J. Earth Sci., vol. 19, no. 10, p. 1985-1993, 1982.

This ongoing collaboration encompasses systematic development of methods, and regional chronologic studies. During the report period Schwarcz was on leave in Israel and investigating archaeometric applications there. Ford completed regional chronologic studies in the Mendip Hills, England, continued programmes in the Canadian Rockies and Eire. The antiquity of a major deposit of Ursus spelaeus at Postojna, Yugoslavia, has been established. New studies were begun of Vancouver Island and Derbyshire (U.K.) samples. With S.-E. Lauritzen (PDF, Chemistry, Oslo), the first studies of humic and fulvic acids in speleothem were conducted, using specimens from Nahanni Park, Crowsnest Pass, and Puerto Rico. A feasibility study of electron spin resonance in stalagmite was concluded with promising results. Latham continued studies of the magnetic westward drift as revealed in speleothems of Holocene age, working with Mexican samples, and made a new specimen collection in Vancouver Island.

445. SIBUL, U., LYE, J., REYNOLDS, L., SCAFE, M., Ontario Ministry Environment (Water Resources Br.):
The inventory and study of acidic groundwaters in Ontario (APIOS), 1980-.

To date, an inventory of field pH's has been completed in the Muskoka/Haliburton, Sudbury and North Bay to Timmins areas, and field surveys of groundwater quality and discharges in the calibrated watersheds in the APIOS in the Muskoka area have been carried out. Monitoring of groundwater pH values near Bracebridge will continue for a number of years. Some work was begun in private domestic systems using acidic lake waters near Sudbury.

446. SKLASH, M.G., Univ. Windsor (Geology):
The feasibility of using the environmental isotope hydrograph separation method to separate annual stream flow hydrographs of the APIOS calibrated watersheds, 1982-83.

447. SKLASH, M.G., ATTANAYAKE, P., Univ. Windsor (Geology):
A field investigation of groundwater ridging, Ontario, 1982-83; M.A.Sc. thesis (Attanayake).

Sees
An investigation of the groundwater ridging hypothesis for storm runoff generation; Can. Hydrology Symp.: '82, p. 575-596, 1982.

448. SKLASH, M.G., JACOBS, J., JIWANI, R., Univ. Windsor (Geology):
The hydrogeology of Walpole Island, Ontario, 1982-85; M.Sc. thesis (Jiwani).

449. SKLASH, M.G., OBRADOVIC, M., Univ. Windsor (Geology):
The role of groundwater in storm runoff of Apex Creek, Northwest Territories, 1982-84; M.A.Sc. thesis (Obradovic).

450. SKLASH, M.G., ORPWOOD, T., Univ. Windsor (Geology):
Lead, cadmium, PCB, and octachlorostyrene in the shallow groundwater of Essex County, Ontario, 1982-83; M.A.Sc. thesis (Orpwood).

451. SKLASH, M.G., SYMONS, D.T.A., ALI, J., Univ. Windsor (Geology):
Electrical resistivity studies of three landfills in Essex Country, Ontario, 1980-83; M.Sc. thesis (Ali).

432. SKLASH, M.G., TUREK, A., GALINSKI, C., Univ. Windsor (Geology):
Heavy metals in the shallow groundwater of Essex County, Ontario, 1982-83; M.Sc. thesis (Galinski).

433. SMART, C.C., FORD, D.C., McMaster Univ. (Geography):
The Castleguard Mountain-Columbia Icefield karst aquifer, Banff National Park, Alberta, 1979-83; Ph.D. thesis (Smart).

434. VALLERY, D.J., SIBUL, U., Ontario Ministry Environment (Water Resources Br.):
Groundwater level fluctuations in major hydrogeologic environments in Ontario, 1981-83.

435. VALLERY, D.J., SIBUL, U., Ontario Ministry Environment (Water Resources Br.):
Groundwater quality network, 1982-.

See:
Groundwater quality fluctuations – a pilot study; Ontario Ministry of the Environment, Water Resources Paper 11, 1982.

1) Establishing natural, background groundwater quality conditions and determining changes or trends in this water quality over the long term. 2) Monitoring groundwater quality in the water supply aquifers of the Province to determine the continued suitability of water supplies or the nature of changes or trends in the quality of the supplies, especially in relation to the persistence of hazardous contaminants. 3) Accomodating special groundwater studies as required by MOE objectives of ensuring the suitability of groundwater supplies for intended use.

436. van der KAMP, G., Saskatchewan Research Council (Geology):
Groundwater flow in glacial tills, Saskatchewan, 1982-.

The hydraulic properties of glacial tills are as yet poorly understood and quantified, particularly with regard to the possible effects of fractures. Research will be directed at studying the movement of groundwater through tills by means of a variety of techniques including well response and pumping tests, laboratory tests, analysis of water levels, chemical and isotope analysis and numerical modelling. The final aim is to achieve improved evaluation and management of groundwater resources in southern Saskatchewan.

437. van EVERDINGEN, R.O., BANNER, J.A., Environment Canada (National Hydrology Res. Instit.):
Northern groundwater, and engineering problems related to groundwater flow, Yukon, 1979-.

See:
Management of groundwater discharge for the solution of icing problems in the Yukon; Proc. 4th Canadian Permafrost Conf., p. 212-226, 1982.

Frost blisters of the Bear Rock Spring area near Fort Norman, N.W.T.; Arctic, vol. 35, no. 2, p. 243-263, 1982.

^{34}S and ^{18}O abundances differentiate Upper Cambrian and Lower Devonian gypsum-bearing units, District of Mackenzie, N.W.T. – an update; Can. J. Earth Sci., vol. 19, no. 6, p. 1246-1254, 1982.

Isotope geochemistry of dissolved, precipitated, airborne and fallout sulfur species associated with springs near Paige Mountain, Norman Range, N.W.T.; ibid., p. 1395-1407, 1982.

Work continued to develop 1) liquid-pressure sensors for use in seasonally freezing/thawing environments, and 2) a recording interface for AC resistance signals from multisensor freezing detectors. A report on frost blisters in North Fork Pass, Yukon, was prepared and submitted to Canadian Journal of Earth Sciences. A paper on "Ground movements and dendrogeomorphology in a small icing area on the Alaska Highway, Yukon" has been prepared for presentation at the 4th Int. Conf. on Permafrost.

458. van EVERDINGEN, R.O., BANNER, J.A., Environment Canada (National Hydrology Res. Instit.):
Thermal springs in Rocky Mountain National Parks, 1980-.

A report is in preparation on correlation of sediment problems at Miette and Radium Hot Springs with other short-lived phenomena.

459. WANG, K.T., OSTRY, R.C., Ontario Ministry Environment (Water Resources Br.):
Groundwater probability mapping, 1966-.

See:
Groundwater probability of the northern portion of Simcoe Country; Ontario Ministry of the Environment, Water Resources Map 2126, 1982.

Probable groundwater yields for counties in Ontario are mapped based on information from existing water-well records. Maps for Grey County have been completed; maps for Huron County and the Regional Municipality of Durham are in draft form; work is proceeding on the counties of Bruce and Northumberland.

460. WANG, K.T., OSTRY, R.C., McKENNA, F.P., WOELFLE, J., Ontario Ministry Environment (Water Resource Br.):
Hydrogeologic environment and the succeptibility of groundwater to contamination, 1980-.

See:
Susceptibility of groundwater to contamination, Tillsonburg sheet; Ontario Ministry of the Environment, Water Resources Map S106, 1982.

Susceptibility of groundwater to contamination, Bothwell sheet; Ontario Ministry of the Environment, Water Resources Map S107, 1982.

Susceptibility of groundwater to contamination, Newmarket sheet; Ontario Ministry of the Environment, Water Resources Map S108, 1982.

The mapping defines the degree of susceptibility of groundwater to pollution from surface or near-surface contamination sources throughout Ontario. Seven topographic sheets (1:50,000 scale) have been published to date.

461. WEYER, K.U., Environment Canada (National Hydrology Res. Instit.):
Investigation of groundwater flow in the Pine Point area, Northwest Territories, 1978-82.

A final report has been prepared.

462. WOODBURY, A.D., SMITH, J.L., Univ. British Columbia (Geological Sciences):
Thermal effects of three dimensional groundwater flow, 1982-83; M.Sc. thesis (Woodbury).

Numerical solutions of the equations of fluid flow and heat transport in porous media are used to quantify the effects of three dimensional regional groundwater flow on the thermal regime. The Galerkin Finite Element method is used to solve the coupled equations governing fluid and heat transfer. Tetrahedral shaped elements employing linear basis functions are used to subdivide the region. The resulting equations are non-linear with temperature and thus a "leap frog" iteration technique is used to ensure convergence of the solutions. A series of computer simulations were carried out to investigate how typical three dimensional flow systems can influence heat flow measurements. The proper measurement and understanding of heat flow values is essential in studies of tectonics (regional heat flow), oil maturation, low temperature geothermal environments, and nuclear waste repositories. Modeling consisted of a three dimensional hypothetical basin with a 40 km separation between the regional topographic high and low. Emphasis was placed on understanding the conditions under which groundwater flows severely perturb the thermal field. The transition for a conduction-dominated to an advection-dominated thermal regime was found to be sharp and depends on the length, depth and width of the basin, water table configuration, magnitude and distribution of thermal conductivity, permeability and hydraulic anisotropy. Deviations of surface heat flow from background heat flux are a measurable effect of groundwater flow and depend on the same factors. Results show that from zero to almost 100 per cent of the section may have surface heat flow values significantly different from the background heat flow depending on the nature of the hydrogeologic environment.

463. YAKUTCHIK, T.J., McKENNA, F.P., Ontario Ministry Environment (Water Resources, Br.):
Development of groundwater supplies for municipal water works systems, 1957-.

Involves carrying out groundwater surveys for municipalities on request, making recommendations for the development for supplies based on estimated groundwater availability and supervising test drilling, pumping tests, and the construction of final supply wells.

464. BARRETT, T.J., YEH, H.-W., McMURTRY, G., TAYLOR, P., SCOTT, S.D., FRIEDRICHSEN, H., Univ. Toronto (Geology):
Elemental and isotope geochemistry of hydrothermal metalliferous deposits and basalts from spreading axes in the East Pacific, 1981-85.

See:
Elemental and isotopic composition of some metalliferous and pelagic sediments from the Galapagos mounds area, DSDP Leg 70; Chemical Geol., vol. 36, p. 275-298, 1982.

Strontium and oxygen isotopic composition of some basalts from Hole 504B, Costa Rica Rift, DSDP Legs 69 and 70; Earth Planet Sci. Lett., vol. 60, p. 27-38, 1982.

To further investigate 1) sedimentary metalliferous deposits overlying basaltic crust in the proximity of spreading axes, and 2) the alteration of such crust by seawater circulating through hydrothermal convection systems. Detailed sampling of the Galapagos mounds cores (at Scripps) will allow more refined formational temperatures to be assigned to the nontronitic material which constitutes the bulk of the metalliferous deposits (temperatures inferred from O-isotopic data), and a more complete compositional and mineralogical characterization of the Fe-silicate and Mn-oxide deposits present in the mounds. Pb and Sr isotopic analyses will allow assessment of the role of the basement as a source of these metals in the overlying sediments. Stable isotopic data for young basalts from three different East Pacific spreading centers are nearly complete, and reveal the effects of both seawater/rock ratio and temperature in producing isotopic modifications of the crust. Application has been made to Scripps for samples from the forthcoming Leg 92 transect of the East Pacific Rise (basal metalliferous sediment layer in particular).

465. BLASCO, S.M., Geol. Surv. Can.:
Surficial geology of Lomonosov Ridge, Arctic Ocean, 1978-.

466. BUCKLEY, D.E., Geol. Surv. Can.:
Environmental geology of the deep ocean, 1979-.

467. CHASE, R.L., SCOTT, H.P., DELANEY, J., KASSTEN, J., SCOTT, S.D., BASSETT, T., TUNNICLIFFE, V., Univ. British Columbia (Geological Sciences, Oceanography), Univ. Washington, Univ. Toronto, Univ. Victoria:

Study of seamounts, N.E. Pacific; Search for hydrothermal deposits, N.E. Pacific; 1970-.

In 1983 it is planned to seek hydrothermal areas at the intersections of Cobb-Eikelberg seamount Chain and Juan de Fuca Ridge, N.E. Pacific Ocean.

468. FORBES, D.L., Geol. Surv. Can.:
Sediment dynamics and depositional processes in the Coastal Zone, 1982-.

469. GILBERT, R., LEMON, D., Queen's Univ. (Geography):
Glaciomarine and glaciolacustrine sedimentary environments of Baffin Island, Northwest Territories, 1976-; M.Sc. thesis (Lemon).

See:
Contemporary sedimentary environments on Baffin Island, N.W.T., Canada: Glaciomarine processes in fiords of eastern Cumberland Peninsula; Arctic and Alpine Res., vol. 14, p. 1-12, 1982.

The Broughton Trough on the continental shelf of eastern Baffin Island, Northwest Territories; Can. J. Earth Sci., vol. 19, p. 1599-1607, 1982.

Seismic data from 10 fiords on the east coast of Baffin Island are being examined to assess sedimentary processes, total accumulation, and relation to the morphology of the drainage basin. Studies are also being carried out of the evolution of intertidal flats associated with sea ice processes and Holocene sea level changes, and of the processes of sedimentation in nearby proglacial lakes.

470. JACKSON, H.R., Geol. Surv. Can.:
Surficial geology and crustal structures of the Alpha Ridge, Arctic Ocean, 1981-.

471. JOSENHANS, H.W., Geol. Surv. Can.:
Surficial geology, geomorphology and glaciology of the Labrador Shelf, 1981-.

472. KOBLUK, D.R., Univ. Toronto (Geology):
Geology and ecology of reef cavities, Bonaire, Netherlands Antilles, 1979-.

A survey of the organism groups inhabiting growth framework cavities in the forereef slope of the west coast of Bonaire, Netherlands Antilles. At present, emphasis is upon documenting sediment distribution, the bryozoan fauna and the diatom flora in cavities in the depth range 1 to 78 meters.

473. KOBLUK, D.R., Univ. Toronto (Geology):
Geology and ecology of reef cavities in the intertidal reef flats, Malololailai Island, Fiji Islands, 1983-.

Documentation of the micro- and macrobiota inhabiting growth framework cavities in the intertidal reef flats of the windward coast of Malololailai Island, in the Fiji Group. Among the aspects of cavity communities and structure that will be studied are the bryozoans, diatoms, echinoderms, calcareous algae, and biological eroders in addition to the sediment distribution.

474. LEWIS, C.F.M., Geol. Surv. Can.:
Ice scouring of Continental Shelves, 1979-.

475. LOGAN, A., Univ. New Brunswick, Saint John (Geology):
Deep-water hard substrate benthic communities, Head Harbour Passage, Bay of Fundy, 1982-85.

476. LOGAN, A., Univ. New Brunswick, Saint John (Geology):
Interspecific competition in corals from Bermudian Holocene reefs, 1982-85.

477. MacLEAN, B., Geol. Surv. Can.:
Eastern Baffin Island shelf bedrock and surficial geology mapping program, 1976-.

478. MAH, A., STEARN, C.W., McGill Univ. (Geological Sciences):
The effect of a hurricane on a fringing reef, Barbados, 1980-83; M.Sc. thesis (Mah).

479. ORTIZ, T., STEARN, C.W., McGill Univ. (Geological Sciences):
Environment and origin of the depressions in front of the Bellairs fringing reef, Barbados, 1980-83; M.Sc. thesis (Ortiz).

480. PIPER, D.J.W., Geol. Surv. Can.:
Quaternary geologic processes on continental slopes, 1981-.

See:
Effects of the 1929 Grand Banks earthquake on the continental slope off eastern Canada; Geol. Surv. Can., Paper 82-1B, p. 147-151, 1982.

Pisces IV submersible dives on the Scotian Slope at 63°W; Geol. Surv. Can., Paper 83-1A, p. 65-69, 1983.

Acoustic interpretation of Quaternary sedimentation and erosion on the channelled upper Laurentian Fan, Atlantic margin of Canada; Can. J. Earth Sci., vol. 19, no. 10, p. 1974-1984, 1982.

481. SCHAFER, C.T., Geol. Surv. Can.:
Continental slope geologic processes off Newfoundland and Labrador, 1978-.

482. SCOTT, S.D., CHASE, R.L., McILWRAITH, S., BARRETT, T.J., Univ. Toronto (Geology):
Hydrothermal vents on ridge crests and seamounts of the East Pacific Rise and Juan de Fuca Ridge, Pacific Ocean, 1982-.

Scott was a member of the dive team using the submersible ALVIN to examine the hydrothermal mounds forming today in the Guaymas Basin, Gulf of California. He is doing a detailed mineralogical and geochemical study of the returned samples and a comparative geological study among Guaymas Basin, 21°N and selected ancient massive sulfide deposits. McIlwraith is comparing the mineralogy and textures of samples from 21°N and massive sulfide ore from Cyprus. Barrett, Chase and Scott are involved in two PISCES dive programmes in the summer of 1982 to explore seamounts near 46°N on the East Pacific Rise.

483. TAYLOR, R.B., Geol. Surv. Can.:
Coastal environments and processes in Canadian Arctic Archipelago, 1982-.

COAL GEOLOGY/
GÉOLOGIE DU CHARBON

484. CAMERON, A.R., Geol. Surv. Can.:
Petrographic examination of coking coals from the Kootenay Formation, Alberta and British Columbia, 1961-.

485. CAMERON, A.R., Geol. Surv. Can.:
Petrographic analysis of Saskatchewan lignites, 1972-.

486. CAMERON, A.R., Geol. Surv. Can.:
Relationship of reflectance to chemical rank parameters of western Canadian coals, 1979-.

487. CAMERON, A.R., Geol. Surv. Can.:
Regional coal rank variations in the Kootenay Formation and their relationship to the structural history of the southern Canadian Rocky Mountains, British Columbia-Alberta, 1981-.

488. FYFE, W.S., WINDER, C.G., LONG, D.G.F., TRY, C.F., KRONBERG, B.I., van der FLIER, E., Univ. Western Ontario (Geology), Laurentian Univ. (Geology):
Stratigraphy and geochemistry of Northern Ontario carbonaceous deposits, 1982-85; M.Sc. thesis (Try).

To determine the sedimentology, stratigraphy and geochemistry of Northern Ontario carbonaceous deposits, including recent and Holocene peats, and Cretaceous lignites. Preliminary trace element work and stratigraphic field work completed.

489. GOODARZI, F., Geol. Surv. Can.:
Compositional characteristics of coals from Hat Creek, British Columbia, 1977-.

490. GOODARZI, F., Geol. Surv. Can.:
Mineral matter and trace element content of Canadian coals, Alberta 1978-.

491. GRIEVE, D.A., PRETO, V.A., SUTHERLAND-BROWN, A., British Columbia Ministry Energy, Mines, Petrol. Res. (Geol. Br.):
Geology and coal resources of the southern half of the Elk Valley coalfield, southeastern British Columbia, 1980-84.

Detailed mapping (1:10,000) of area south of Fording Coal's minesite at Eagle Mountain is complete; nine complete sections of coal-bearing Mist Mountain Formation measured; grab sampling of coal seams (approximately 600 samples) carried out during mapping; channel sampling of coal seams within or near measured sections complete (approximately 100 samples); petrographic analysis of coal samples underway; tonsteins sampled at two locales; and chemical and petrographic analysis of tonstein samples underway.

492. HACQUEBARD, P.A., Geol. Surv. Can.:
Rank and petrographic studies of coal and organic matter dispersed in sediments, 1968-.

493. HACQUEBARD, P.A., Geol. Surv. Can.:
Microscopic study of pyrite in main seams of Sydney coalfield, Nova Scotia, 1975-.

494. HUGHES, J.D., Geol. Surv. Can.:
Resource evaluation and geology of Canadas' coal deposits, 1981-.

495. HYDE, R.S., HISCOTT, R.N., WRIGHT, J.A., MILLER, H.G., Memorial Univ. (Earth Sciences):
Tectonic, sedimentary and thermal evaluation of Carboniferous basins of western Newfoundland with emphasis on the Deer Lake Basin, 1982-83.

To establish maturation levels of organic matter and illite crystallinity in Carboniferous strata in the Deer Lake Basin of western Newfoundland. It is hoped that this can be related to the tectonic history of the basin, which involved strike-slip faulting and rifting. It will also help to assess the petroleum potential of the basin.

496. JERZYKIEWICZ, T., Geol. Surv. Can.:
Study of coal-bearing Upper Cretaceous and Paleocene formations, central Alberta Foothills, 1981-.

497. KALKREUTH, W.D., Geol. Surv. Can.:
Optical properties of coals and dispersed organic materials, 1975-.

498. KALKREUTH, W.D., Geol. Surv. Can.:
An investigation of the semi-inert constituents of western Canadian coals, 1979-.

499. KALKREUTH, W., Geol. Surv. Can.:
Evaluation of liquefaction potential of low rank coals and peats, 1981-.

500. KALKREUTH, W., Geol. Surv. Can.:
Regional coalification studies in the Minnes, Bullhead and Fort St. John groups, northeastern British Columbia, 1981-.

See:
Preliminary results on rank and composition of coals from the Gething Formation north of Peace River, northeastern British Columbia; Geol. Surv. Can., Paper 82-1C, p. 65-69, 1982.

501. KAMENKA, L.A., Geol. Surv. Can.:
Evaluation of coal deposits of western Canada, 1976-.

502. KILBY, W.E., British Columbia Ministry Energy, Mines, Petrol. Res. (Geol. Br.):
Northeastern British Columbia coal study, 1982-.

Study will include a 1:50 000 scale map compilation of the coal bearing strata in northeastern British Columbia. Data sources are company reports on open file and information from past Ministry investigations. The structural styles of various deposits along the foothills will be examined with the emphasis being on the use of computer based techniques. Geostatistical investigations of the various deposits will examine the variations in coal seam thickness and quality.

503. KOO, J., McMILLAN, W.J., British Columbia Ministry Energy, Mines, Petrol. Res. (Geol. Br.):
Study and evaluation of Telkwa coal measures near Smithers, British Columbia, 1982-84.

To reveal the stratigraphy, structural development, depositional environments, and geologic age of the Telkwa Basin; the correlation of coal seams and their quality, rank and number; the areal extent of the coal measures and their relationships to surrounding rocks; coal reserves; geologic relationships of the Telkwa coal measures to other major coal-bearing formations in northwestern British Columbia; deposit models as regional and local exploration guides.

504. LEGUN, A.S., PRETO, V.A., British Columbia Ministry Energy, Mines, Petrol. Res. (Geol. Br.):
Geological mapping and studies of northeastern coalfields, British Columbia, 1982-.

Geologic studies with particular reference to stratigraphic correlation, dating and understanding of the environment of deposition of northeast coals. Volcanic ash layers (tonsteins) and fossiliferous beds to be used in particular.

505. NANDI, B.N., MacPHEE, J.A., CIAVAGLIA, L.A., EMR (CANMET):
Oxidation studies and alkane distribution of eastern and western Canadian coals, 1977-83.

506. NANDI, B.N., MacPHEE, J.A., CIAVAGLIA, L.A., EMR (CANMET):
The improvement of liquefaction propensities of low grade oxidized coal from Western Canada using CO, H_2, 1980-83.

See:
The role of the water gas shift reaction in upgrading of low-rank oxidized coal from western Canada for conversion processes; Proc. 32nd Canadian Chem. Eng. Conf., vol. 1, p. 497-505, 1982.

Improvement of liquefaction propensity of low-grade oxidized coal from western Canada via the water gas shift reaction; Proc. Internat. Coal Conversion Conf., 1982.

507. NANDI, B.N., MacPHEE, J.A., CIAVAGLIA, L.A., EMR (CANMET):
Upgrading of marginal coking for the production of metallurgical coke, 1981-83.

508. NURKOWSKI, J.R., Alberta Research Council (Geol. Surv.):
Geology and coal resources of the Scollard Formation, central Alberta, 1981-84.

509. RICKETTS, B.D., Geol. Surv. Can.:
Studies of coal basins of western and northern Canada, 1977-.

510. WAHEED, A., MIALL, A.D., Univ. Toronto (Geology):
Sedimentology of Cretaceous coal-bearing strata, Drumheller area, Alberta, 1980-83; M.Sc. thesis (Waheed).

Core and outcrop analysis of the Bearpaw and Horseshoe Canyon Formations has revealed a complex coal seam stratigraphy. The sediments were deposited in a variety of fluvial, deltaic and barrier-bar environments. The thickest coals are associated with channel margin swamps.

511. WHITE, G.V., KARST, R.H., British Columbia Ministry Energy, Mines, Petrol. Res. (Geol. Br.):
A coal rank study of the Gething Formation in the Peace River region, northeastern British Columbia, 1980-83.

One hundred and sixty coals were collected in northeastern British Columbia from the top of the Gething Formation and their ranks determined petrographically. The advantage of sampling a specific stratigraphic horizon is that it eliminates coal rank variation caused by differences in age and placement within the sedimentary column. The resulting coal rank map indicates that coal rank increases slowly by steadily from the undisturbed plains of the Western Canadian Sedimentary Basin to its structural margin of the foothills belt. This increase corresponds to an increase in the depth of cover overlying the Gething Formation. Near the foothills however coal rank accelerates upward to peak at the very front of the structural margin (the Gething Formation is still in the deep subsurface). This acceleration of increasing coal rank is due to tectonism which has piled on extra sedimentary cover by thrusting. Within the foothills belt itself, the Gething Formation is thrown to the surface and coal rank decreases rapidiy. This decrease can be attributed to coalification which is in part post-orogenic. Also, crustal shortening has condensed the foothills belt such that if unraveled the points of coal sampling would be considerably more westward, thus accenting the coal rank decrease.

The rank map readily identified those areas where the Gething coals are of high, medium, low volatile bituminous and semi-anthracite rank. Coal ranks in other formations can be determined by using a correction factor derived from the coalification gradient applicable to that area. The rank map can also be used to delineate those areas where oil occurrence is unlikely because of the degree of organic metamorphism. The rapid drop of coal rank within the foothills belt suggests that oil occurrence is possible west of the structural front.

512. ZODROW, E.L., College of Cape Breton (Geology):
Trace-elemental study in Cape Breton Coals, Sydney Coalfield, Nova Scotia, 1977-85.

Analysis of channel samples (15 cm increments) for more than 50 elements shows that the coals are zoned, without exception. All major coal seams are now represented in the study.

INDUSTRIAL MINERALS/SUBSTANCES MINÉRALES INDUSTRIELLES

513. AUBERTIN, R.A., JACOB, H.L., CIMON, J., Québec Ministère Énergie et Ressources:
Inventaire des marbres de la région de l'Outaouais, Québec, 1983-84.

Recherche et évaluation préliminaire de dépôts de marbre en vue d'applications industrielles. Caractérisations des dépôts au point de vue composition chimique, blancheur et propriétés physiques.

514. BANNATYNE, B.B., Manitoba Dept. Energy and Mines (Geol. Services Br.):
Rare element minerals in pegmatites in Manitoba, 1972-83.

515. BUTEAU, P., JACOB, H.L., CIMON, J., Québec Ministère Énergie et Ressources:
Inventaire des tourbières de la région de Natashquan, Basse Côte Nord, Québec, 1983-84.

Reconnaissance et définition des groupements végétaux ainsi que de la stratification des dépôts. Evaluation qualitative et quantitative de la tourbe.

516. CHRISTIE, R.L., Geol. Surv. Can.:
Geology of bedded phosphate deposit in Canada, 1976-.

517. EDWARDS, W.A.D., Alberta Research Council (Geol. Surv.):
Aggregate resources of the Drumheller area, Alberta, 1983.

One of a series of reconnaissance-level aggregate potential maps (at a scale of 1:250,000) derived primarily from existing surficial geology information. It is intended to provide aggregate resource data for general land-use planning, land management or aggregate exploration until such time as more detailed maps or reports are available for the area.

518. EDWARDS, W.A.D., Alberta Research Council (Geol. Surv.):
Aggregate resources of the Evansburg and Barrhead areas, Alberta, 1983-84.

Two 1:50,000 NTS sheets of the Evansburg and Barrhead area, Alberta were surveyed in 1982.

519. EDWARDS, W.A.D., HUDSON, B., Alberta Research Council (Geol. Surv.):
Aggregate supply and demand study, east-central Alberta, 1982-83.

To assemble the information gained through the Aggregate Inventory into a concise and useable form which can be then integrated with economic and market conditions, projected population and municipal growth, and other natural resources developments to establish scenarios for present and future aggregate use. The information generated for this assessment and the recommendations resulting from it will be recorded in a report which can be used in planning and resource management and will be presented to all municipalities and Departments with an interest in the study area.

520. FOX, J.C., Alberta Research Council (Geol. Surv.):
Aggregate resources of the Hinton area, Alberta, 1982-83.

Four 1:50,000 NTS sheets near Hinton, Alberta were surveyed in 1982.

521. FOX, J.C., Alberta Research Council (Geol. Surv.):
Aggregate resources of NTS Map Sheet 82/0, Calgary, Alberta, 1983.

522. FOX, J.C., Alberta Research Council (Geol. Surv.):
Aggregate resources of the Hinton, Edson, Drayton Valley area, Alberta, 1983-84.

Six 1:50,000 NTS sheets to be surveyed in 1983.

523. FUZESY, L.M., Saskatchewan Geol. Surv.:
Geology of the potash ore of the Middle Devonian Prairie Formation, Saskatchewan, 1981-83.

See:
Petrology of potash ore in the Esterhazy Member of the Middle Devonian Prairie Evaporite in southern Saskatchewan; Fourth Internat. Williston Basin Symp., 1982.

Study concentrates largely on geological problems which affect or have the potential of affecting the economics of potash mining and safety of the mines in Saskatchewan. Principal objectives of this work include the following: 1) extensive geological studies of the Prairie Evaporite and the underlying and overlying strata in the commercial potash areas of the Province of Saskatchewan; 2) stratigraphic correlation of the main potash-bearing members of Prairie Formation; 3) study of the origin of the potash minerals (sylvite, carnallite) and halite and their diagenesis; 4) investigation of the nature and origin of salt horses; and 5) study of the structurally disturbed, fractured zones within the Prairie Evaporite.

524. GIBBINS, W.A., Indian and Northern Affairs Canada:
Carving stone project, Northwest Territories, 1981-83.

See:
Economic geology of carving stone, Northwest Territories; Geol. Assoc. Can. – Mineral Assoc. Can., Program with abstracts, vol. 7, p. 52, 1982.

1981-82 exploration and evaluation in southern Baffin, northern Baffin and Indin Lake resulted in two new sources of carving stone. One of these (Mary River) is in active use by Pond Inlet and Clyde River carvers. 1983 efforts will be directed to known ultramafic rocks on Prince of Wales Island and northern Boothia Peninsula. Petrographic studies of various carving stones is planned. I am interested in hearing of additional locations of potential carving stone in the Northwest Territories.

525. GULIOV, P., Saskatchewan Geol. Surv.:
Buffalo Narrows fuel past production and utilization demonstration project, Saskatchewan, 1982-83.

See:
Fuel peat demonstration project; Saskatchewan Geol. Surv., Misc. Rept. 82-4, 1983.

Project is directed toward the demonstration of existing technology of fuel peat bog development, extruded sod production and the utilization of fuel peat for domestic heating. Approximately 8 tonnes of sod peat fuel was produced from an experimental bog near Buffalo Narrows during 1982. The fuel will be used for heating in several homes and the municipal garage in Buffalo Narrows during the winter of 1982-83.

526. HORA, Z.D., British Columbia Ministry Energy, Mines, Petrol. Res. (Geol. Br.):
Sand and gravel study – populated areas and transportation corridors, 1979-83.

527. HORA, Z.D., British Columbia Ministry Energy, Mines, Petrol. Res. (Geol. Br.):
Silica resources of British Columbia, 1981-84.

528. HORA, Z.D., CLANCY, J., British Columbia Ministry Energy, Mines, Petrol. Res. (Geol. Br.):
Barite deposits of British Columbia, 1980-84.

529. HOWSE, A.F., DEAN P.L., Newfoundland Dept. Mines and Energy:
An assessment of Newfoundland's barite resources, 1982-84.

See:
Barite Evaluation: eastern and western Newfoundland; Newfoundland Dept. Mines and Energy, Rept. 83-1, p. 130-156, 1983.

The 1982 field work was carried out on the Avalon Peninsula and west coast. On the Avalon, a coastal geological investigation was made of barite occurrences along the shores of Trinity and Placentia Bays. On the west coast work was concentrated in areas of the St. George Carboniferous Basin and involved detailed geological investigations of barium anomalies that had been identified by a government sponsored 1974 regional stream sediment geochemical survey.

530. KIRBY, F.J., RICKETTS, R.J., RICKETTS, M.J., VANDERVEER, D.G., Newfoundland Dept. Mines and Energy:
Inventory of aggregate resources, Newfoundland and Labrador, 1978-83.

The project was carried out within a 6 km wide corridor centering on and parallel to all existing and proposed transportation routes. The study area also included an eight to eighty km radius around all towns or large population centers.

The study consisted of a primary surficial interpretation followed by field mapping and sampling. Data were gathered on landforms and stratigraphy as well as a field description of the sample and deposit types. Particle size and lithological analysis of the materials sampled were also conducted.

The location of samples and deposits were mapped onto 1:50,000 topographic base maps and are summarized for publication at a 1:250,000 scale. Surficial geology maps were produced at a 1:50,000 scale for open file release as will be the bedrock geology maps produced at a 1:250,000 scale.

Work is progressing on a computer package that will report on all coded field and laboratory data in an "english-like" format and enable the search and retrieval of selected data for various users for various proposes.

Data is now on file for approximately 10,000 samples. Data includes site and sample information, particle size analysis and cumulative graphs, lithological analysis, petrographic numbers, stratigraphic logs and photographs.

531. KIRBY, F.J., VANDERVEER, D.G., Newfoundland Dept. Mines and Energy:
Detailed aggregate assessment in Newfoundland, 1982-.

To locate, map and sample areas of aggregate potential in areas where such reserves are lacking, where reserves are rapidly being depleted or where conflicting land use threaten to sterilize areas with high aggregate potential.

The 1982 program was aimed at locating, mapping and sampling sources of aggregate potential within a number of Municipal Planning areas throughout the island, and having these areas recognized in the Municipal Plans as areas reserved for aggregate extraction.

Mapping was normally at a scale of 1:12,500 on Orthophoto base maps, but where sampling densities dictate, larger scale maps were used. Backhoe test pitting was used extensively to help determine the stratigraphic characteristics, the quality and the estimated depth of each deposit for quantity estimates.

532. NANTEL, S., JACOB, H.L., CIMON, J., Québec Ministère Énergie et Ressources:
Inventaire des granites pour la pierre de taille, 1983-84.

Recherche et évaluation de granits utilisables comme pierre de taille à des fins ornementales ou architecturales; délimitation de zones favorables à l'extraction.

533. RICHARDSON, R.J.H., Alberta Research Council (Geol. Surv.):
Aggregate resources of the Drayton Valley area, Alberta, 1982-83.

Five 1:50,000 sheets near Drayton Valley, Alberta were surveyed in 1982.

534. RICHARDSON, R.J.H., Alberta Research Council (Geol. Surv.):
Aggregate resources of the area north of Grande Cache, Alberta, 1983-84.

One of a series of reconnaissance-level aggregate potential maps (at a scale of 1:250,000) derived primarily from existing surficial geology information and limited field checking. It is intended to provide aggregate resource data for general land-use planning, land management or aggregate exploration until such time as more detailed maps or reports are available for the area.

535. RICHARDSON, R.J.H., Alberta Research Council (Geol. Surv.):
Aggregate resources of the Medicine Hate area, Alberta, 1983.

536. RICKETTS, M.J., VANDERVEER, D.G., Newfoundland Dept. Mines and Energy:
The coastal Labrador aggregate resources inventory, 1983-85.

Identify areas of sand and gravel for the use of community councils for municipal servicing, road upgrading, housing construction, etc. Designate aggregate areas suitable to meet the long term needs of communities; i.e. secure from conflicting land uses. Identify surface landforms with particular emphasis in determining areas suitable or unsuitable for a variety of purposes such as 1) hydrogeological formations for screened or drilled wells for local water supplies, 2) areas of terrain suitable for various community needs (i.e. housing, recreation, roads or servicing, etc.).

To identify the geotechnical properties of the sub soil, overburden and bedrock materials to assist pre-engineering studies for route selection for roads, water (or sewage) mains, i.e. identify problem areas to ensure adequate design prior to construction. To work with each community to identify problem terrain areas in regard to either provision of community services or the protection of residents from material hazards (i.e. slope stability investigations, etc.).

537. RILEY, J.L., TELFORD, P.G., Ontario Geol. Surv.:
Ontario peatland inventory project, Ontario, 1981-86.

To assess fuel and horticultural peat resources in selected areas of Ontario. Detailed studies of peat stratigraphy and peatland formations are made of the largest and most accessible peatlands, with subsequent laboratory analysis of the peat characteristics of representative cores. Site mapping and regional mapping of peatlands is based on air photo interpretation, satellite imagery and field studies.

538. SHAM, P., Alberta Research Council (Geol. Surv.):
Aggregate resources of the Mayerthorpe area, Alberta, 1982-83.

Five 1:50,000 NTS sheets near Mayerthorpe, Alberta were surveyed in 1982.

539. SHAM, P., Alberta Research Council (Geol. Surv.):
Aggregate resources of the Rocky Mountain House map sheet NTS 83/B, Alberta, 1983.

One of a series of reconnaissance-level aggregate potential maps (at a scale of 1:250,000) derived primarily from existing surficial geology informaiton. It is intended to provide aggregate resource data for general land-use planning, land management or aggregate exploration until such time as more detailed maps or reports are available for the area.

540. SHAM, P., Alberta Research Council (Geol. Surv.):
Aggregate resources of the Hinton area, Alberta, 1983-84.

Two 1:50,000 NTS map near Hinton, Alberta will be surveyed in 1983.

541. SOLES, J.A., EMR (CANMET):
Stability of aggregates and cement-aggregate reactivity in concrete, 1965-86.

Research is continuing on the reactivity of various rock types used as aggregate in concrete. It is expected that the work will permit prediction of reactivity and stability from detailed petrographic examination.

542. STEELE, K., Alberta Research Council (Geol. Surv.):
Aggregate resoruces of the Westlock and Hairy Hill area, Alberta, 1982.

Three 1:50,000 NTS map sheets in the Westlock and Hairy Hill area, Alberta were mapped in 1982.

543. THIBAULT, J.J., BARNETT, D.E., New Brunswick Dept. Nat. Res. (Mineral Development Br.):
Granular aggregate resources of the McDougall Lake (NTS 21 G/7) map-area, New Brunswick, 1982-83.

Cartographie et échantillonage des dépôts meubles dans la région au nord de St. George, comté de Charlotte, sud-ouest du Nouveau-Brunswick. Ce projet procure des données de base sur la location et l'importance des dépôts meubles ainsi qu'une évaluation de la qualité et de la quantité du matériel disponible.

544. TREMBLAY, A., JACOB, H.L., CIMON, J., SIMANDL, G., TANGUAY, M.G., IREM, Québec Ministère Énergie et Ressources:
Graphite dans l'Outaouais, Québec, 1983-84; thèse de doctorate (Simandl).

Cartographie géologique au-dessus des zones conductrices révélées au moyen d'un levé électromagnétique. Expliquer la nature des conducteurs; délimiter et évaluer les zones minéralisées en graphite.

545. TROYER, D.R., GULIOV, P., Saskatchewan Geol. Surv.:
Saskatchewan peat resource study, 1982-83.

Sees

Fuel peat potential in the La Ronge region; Saskatchewan Geol. Surv., Misc. Rept. 82-4, 1983.

Work over the past couple of years has resulted in an inventory of the peatlands for the west and central regions of the north-central section of Saskatchewan. Field and laboratory data have been complied from a large number of peat bogs in these two regions. The present study encompasses air photo selection of potential fuel peat deposits and a detail sampling survey of those which meet the requirements.

A final report on the Saskatchewan Peat Resource Study will be completed by April 1983. It will contain all field and laboratory data collected on Saskatchewan peatlands over the past five summers field work.

546. WATSON, D.M., Manitoba Dept. Energy and Mines (Geol. Services Br.):
Silica resources of Manitoba, 1981-83.

Sampling and analysis of samples from potential silica deposits in Manitoba has been completed. The areas of greatest potential include the Precambrian Churchill quartzites, Cretaceous Swan River sandstones and the Ordovician Winnipeg Formation. An open file report with complete geological descriptions and clerical and physical analyses is expected to be ready for June, 1983.

547. WATSON, D.M., Manitoba Dept. Energy and Mines (Geol. Services Br.):
Chromite in the Bird River Sill, Manitoba, 1982-.

Studies underway include chromite mineralogy, platinum group element distribution and the amenability to geophysical exploration.

MINERAL DEPOSITION EXPLORATION/ EVALUATION/RECHERCHE ET ÉVALUATION DES GÎTES MINÉRAUX

548. BALDWIN, D.A., AYRES, L.D., McRITCHIE, W.D., GALE, G.H., Univ. Manitoba (Earth Sciences), Manitoba Dept. Energy and Mines (Geol. Services Br.):
Mineral deposits in the Ruttan Lake, Karsaluwigamak Lake, Muskyak Lake area, 1978-82. Felsic volcanism in the Rusty Lake volcanic belt, Manitoba 1980-84; Ph.D. thesis (Baldwin).

549. BARR, S.M., COLWELL, J.A., YIPCHOY, R., OLDALE, S., Acadia Univ. (Geology):
Granitoid rocks and associated copper skarn mineralization, Whycocomagh Mountain, Cape Breton Island, Nova Scotia, 1981-83; B.Sc. theses (YipChoy, Oldale).

Copper-tungsten-molybdenum skarn mineralization in the Whycocomagh Mountain area is associated with a small pluton of Devonian (402 ± 20 Ma) age, which intruded predominantly metasedimentary rocks of the Hadrynian George River Group. Calcisilicate rocks, derived from marbles of the George River Group, are the chief hosts for the mineralization. Work to date has indicated that the pluton is calcalkalic with I type characteristics and consists largely of granite porphyry and its altered equivalents including endoskarn. The mineralization occurs chiefly but not exclusively in magnetite bearing tremolite rocks derived in part by hydrous alteration of pyroxene-garnet skarns. Further study will attempt to better define the paragenetic sequence of skarn and mineralization events and the distribution of mineralization in other rocks, including the pluton itself.

550. BARRETT, T.J., ANDERSON, G.M., CHEW, W.-L., Univ. Toronto (Geology):
The solubility of sphalerite and galena in high-concentration NaCl brines, 1982-83.

Sees

The solubility of sphalerite and galena in NaCl brines; Econ. Geol., vol. 77, p. 1923-1933, 1982.

Fluid inclusion data from Mississippi Valley type ore deposits indicate that the brines which deposit the Pb-Zn sulphides typically are 1 to 3 m in total dissolved salts, though values up to 5 m occasionally occur. The 1 to 3 m range already has been investigated by Barrett and Anderson (1982), who concluded that such brines were not capable of carrying both metals (as chloride complexes) and sulfide together to the site of ore deposition (for typical temperatures of <150°C). The present study will determine whether this is also the case for brines containing up to 5 m dissolved salts. If so, simultaneous transport of metals and sulfide would be completely ruled out. Models for ore transport and deposition would then be limited to (i) two independent brines, one metal-rich and one sulphide-rich, which meet in the ore zone, (ii) a metal-sulfate brine in which the sulfate is reduced to sulphide by organic material in the ore zone.

551. BELL, R.T., Geol. Surv. Can.:
Geology of uranium resources of Canada, 1975-.

Sees

Comments on the geology and uraniferous mineral occurrences of the Wernecke Mountains, Yukon and District of Mackenzie; Geol. Surv. Can., Paper 82-1B, p. 279-284, 1982.

Investigations in the vicinity of Mount Sedgwick, Yukon Territory; Geol. Surv. Can., Paper 83-1A, p. 473, 474, 1983.

552. BOUCHER, M., CIMON, J., GAUTHIER, M., Univ. Québec à Montréal, Québec Ministère Énergie et Ressources:
Métallogénie des gîtes de plomb-zinc situés dans les formations de carbonates des Appalaches du Québec, 1983-85; thèse de maîtrise (Boucher).

Répertorier les indices de Pb-Zn connus dans les Appalaches. Cartographie détaillée des indices dans la région de Dunham. Reconnaissance sur les indices au voisinage de Gaspé.

553. BRASSARD, B., GAUTHIER, M., CIMON, J., CLARK, T., Univ. Québec à Montréal, Quebec Ministère Énergie et Ressources:
Gîtologie d'un gîte cuprifère au lac Musset, Fosse du Labrador, Québec, 1982-84.

Cartographie locale complétée, études détaillées à faire.

554. BROWN, A.C., École Polytechnique (Génie minéral):
Metallogenic studies of stratiform non-ferrous metal deposits, 1970-.

Sees

Stratiform copper deposits and interactions with co-existing atmospheres, hydrospheres, biospheres and lithospheres; IGCP Symp. Projects 157-160, Mexico City, 1982.

Zoning in metalliferous shales; in Hydrodynamics and geochemistry of ore generation in sedimentary environments, Penrose Conf., Missouri, 1982.

Determination of the genesis of stratiform ores, especially sediment-hosted base-metal mineralization, and definition of guide-lines for exploration for such deposits.

555. BROWN, A.C., École Polytechnique (Genie minéral):
Significance of small iron-formations as metallogenic guides to base-metal deposits in the Grenville Supergroup, Mont-Laurier Basin, Québec, 1980-83.

Sees

Grenville iron-formations and associated stratiform zinc mineralization, Roddick Lake area, Mt. Laurier basin, Quebec; Can. J. Earth Sci., vol. 19, p. 1670-79, 1982.

Correlation of minor iron-formations and stratiform zinc mineralization in the Grenville Supergroup, Quebec; Geol. Assoc. Can. – Mineral Assoc. Can., Program with abstracts, vol. 7 p. 40, 1982.

Determination of the relationships between iron-formations and stratiform zinc mineralization in the Grenville Supergroup.

556. BRUN, J., Québec Ministère Énergie et Ressources:
Recherche de plomb-zinc dans les formations paléozoiques du sud du Québec, 1981-84.

Identifier et caractériser des régions favorables aux minéralisations de plomb et zinc avec assez de précisions pour permettre aux Sociétés minières d'enclancher.

557. BURTON, D.M., McALLISTER, A.L., Univ. New Brunswick (Geology):
Geology of Cam. Bancroft uranium deposit, Ontario, 1978-83; M.Sc. thesis (Burton).

558. CHAINEY, D., PERRAULT, G., MAKILA, A., École Polytechnique (Génie minéral):
Paramètres géochimiques de la minéralisation aurifère de la mine Camflo, Québec, 1980-83; thèse de M.Sc.A. (Chainey).

Voir:
Géologie et géochimie du gisement d'or de la mine Camflo; C.I.M./A.G.M., Québec Programme général, p. 68, 1982.

559. CHARTRAND, F., BROWN, A.C., École Polytechnique (Génie minéral):
Origin of stratiform copper mineralization in the Redstone "Copperbelt", Northwest Territories, 1982-85; Ph.D. thesis (Chartrand).

Sees

Post-sedimentary, redox-controlled, stratiform copper mineralization, Redstone area, N.W.T.; Geol. Assoc. Can. – Mineral. Assoc. Can., Program with abstracts, vol. 7, p. 43, 1982.

Determination of the environment of stratiform copper mineralization at Redstone, and the timing of mineralization relative to syn-diagenesis of the host sediments.

560. CHATTERJEE, A.K., Nova Scotia Dept. Mines and Energy:
Metallogenic assessment of Nova Scotian Devonian – Carboniferous granitoid rocks.

Sees

The distribution of gold in rocks and minerals of the Meguma Group, Nova Scotia, Canada; Chemical Geol., vol. 35, p. 87-95, 1982.

Mineralogical, petrological and geochemical study will continue to develop genetic and exploration models for the granophile deposits in Nova Scotia. Isotopic investigations (oxygen and hydrogen) are being undertaken to evaluate the role of fluids during magmatic, and metasomatic and mineralization stages.

561. CHEVÉ, S.R., SCHRIJVER, K., CLARK, T., INRS-Géoressources:
Cadre géologique et gîtologique des indices minéralisés de la zone centrale nord de la Fosse du Labrador, Québec, 1982-84.

Objectifs: définition du cadre géologique local des indices connus, caractérisation minéralogique, pétrographique et géochimique des indices, modélisation métallogénique, identification des métallotectes.

Etat d'avancement des travaux: une première mission de terrain a été réalisée au cours de l'été 1982, une seconde le sera au cours de l'été 1983.

562. CHEVÉ, S., TRZCIENSKI, W., BROWN, A.C., École Polytechnique (Genie minéral):
Metallogeny of volcanogenic Cu-Zn mineralization in the Megantic region, Eastern Townships, Quebec, 1976-83; Ph.D. thesis (Chevé).

Determination of the regional and local environments of copper-zinc deposits of volcanogenic origin in the volcano-sedimentary series of the Lake Megantic region, Quebec.

563. COLVINE, A.C., WOOD, J., Ontario Geol. Surv.:
Huronian metallogenetic development, 1979-84.

Interpretation of metallogenetic development of the Huronian through intergrated geological, tectonic and mineral deposits studies. Definition of gold provenance areas and paleo-drainge patterns in an attempt to locate areas of paleo-placer gold deposition and concentration.

564. CROCKET, J.H., LAVIGNE, M., McMaster Univ. (Geology):
Gold mineralization in Archean greenstone belts: a study of Dickenson Mine, Red Lake area, Ontario, 1979-83; M.Sc. thesis (Lavigne).

A study of the gold mineralization in the Red Lake camp with most of the work concentrated on the Dickenson Mine, with some lessor study of the Campbell Red Lake deposit. The methods employed include detailed underground mapping (mainly on the ESC ore zone of the Dickenson), trace and major element geochemistry and sulfur isotope analysis. The mapping suggests that the ESC cuts banded iron formation and is probably epigenetic mineralization in a shear zone. The sulfur isotope distributions are usually characterized by a small variation in isotopic composition of different ore or mineralized horizons but with significantly different mean isotopic compositions in different mineralized zone. Band iron formation usually carries some isotopically light sulfur which is detected in the ore zone in close proximity to iron formation. The study is in the final stages of writing up.

565. CROCKET, J.H., McNUTT, R.H., REES, T., SCHWARCZ, H.P., SHAW, D.M., THODE, H.G., BOWINS, R., BLUM, N., HURLEY, T., McROBERTS, G., McMaster Univ. (Geology):
Genesis of Archean iron formation – link with base and precious metal, 1982-85; Ph.D. theses (Bowins, Blum), M.Sc. theses (Hurley, McRoberts).

This research was stimulated by the realization that Precambrian banded iron formation occasionally host gold ore and often is spacially related to either base metal or gold mineralization. Two large iron mines, the Sherman and Adams mines, together with the contiguous stratigraphy, are under study. Detailed geological mapping, geochemical and isotopic studies are in progress on both the iron formations and their associated volcanic and sedimentary rocks. The initial phase of the study is to characterize the iron formations with respect to base and precious metals, rare earths, major elements, oxygen, carbon, sulfur and strontium isotopes using a mapping base derived from large open pit mining operations. The object of this phase of the project is to determine the source of sulfur and metals in iron formations, the depositional temperature, source of carbon and the relative importance of volcanic emanation in the origin of iron formations.

566. CROCKET, J.H., PLOEGER, F., McMaster Univ. (Geology):
Relationship of gold in the Kirkland Main Break to alkalic volcanism, Ontario, 1980-83; M.Sc. thesis (Ploeger).

See:
Relationship of gold to syenitic intrusive rocks in Kirkland Lake; CIM Spec. vol. 24, p. 69-72, 1982.

A detailed geological compilation map of the Kirkland Lake main break and associated gold deposits has been completed. Tests for a link between the alkalic igneous activity of the area, manifest by syenite intrusion and trachytic volcanics, and the gold mineralization have been conducted. Extensive geochemical studies including REE analyses and detailed petrographic studies of both lithologies have been completed and are now being analysed. No significant difference in rare earth patterns of mineralized and barren alkalic rocks have been established to date although the data analysis and evaluation is still in an early stage.

567. CROCKET, J.H., SCHWARCZ, H.P., FYON, J.A., McMaster Univ. (Geology):
Stable isotope studies of gold metallogeny in the Timmins camp, Ontario, 1979-83; Ph.D. thesis (Fyon).

See:
Gold exploration in the Timmins district using field and lithogeochemical characteristics of carbonate alteration zones, CIM Spec. vol. 24, p. 113-129, 1982.

A project on gold metallogeny in the Porcupine camp has centered on the mapping of rock alteration in the vicinity of gold mineralization with laboratory back-up including trace and major element rock geochemistry together with oxygen and carbon isotopic analysis. One of the main objectives was to understand the relationship between carbonate alteration and mineralization. Other aims were to test the importance of alteration and metamorphism on oxygen and carbon isotopic signatures, particularly with respect to whether open system behaviour prevailed. One of the major conclusions of the study is that gold mineralization is associated with carbonate alteration but that carbonate alteration is only one of a number of factors related to the mineralization process. Thus, carbonate altered lithologies are not necessarily auriferous. Another important finding in the study was that oxygen isotope systematic are often disturbed so that thermal information derived from oxygen fractionation may be difficult to interpret.

568. DAIGNEAULT, R., PERRAULT, G., BÉDARD, P., École Polytechnique (Génie minéral):
Géologie et géochimie de la mine Lamaque, Val d'Or, Québec, 1980-83; thèse de M.Sc.A. (Daigneault).

La première partie de ce travail a été publiée: elle établit les relations entre les petits plutons de tonalité et de diorite de la mine Lamaque aux autres intrusifs ainsi qu'aux empilements volcaniques. Ce travail a débouché sur un autre projet de recherche sur la dispersion de l'or autour des gîtes minéraux à la Mine Lamaque.

569. DiLABIO, R.N.W., Geol. Surv. Can.:
Drift prospecting methods and models, 1978-.

See:
Gold and tungsten abundance vs. grain size in till at Waverley, Nova Scotia; Geol. Surv. Can., Paper 82-1B, p 57-62, 1982.

570. DUKE, J.M., Geol. Surv. Can.:
Chromium resources in Canada, 1980-.

571. DUNSMORE, H.E., Geol. Surv. Can.:
Geology of uranium resources of Canada, 1976-.

572. DUQUETTE, G., LACHANCE, S., Québec Ministère Énergie et Ressources:
Recherche de zones skarnifiées à l'ouest des mines de cuivre Gaspé, Québec, 1981-82.

Par voie de forages stratigraphiques établir le potential minéral de la région du mont Vallières de St-Réal.

573. EKSTRAND, O.R., Geol. Surv. Can.:
Geology of Canadian nickel and platinum group deposits, 1963-.

574. FARR, J.E., SCOTT, S.D., Univ. Toronto (Geology):
Geology and geochemistry of the mineralized 070-Fault system, Corbet Mine, Noranda, Quebec, 1981-83; M.Sc. thesis (Farr).

We are examining the geochemistry of prominent quartz veins in the vicinity of Corbet mine in an attempt to establish the relationship, if any, between these veins and massive sulfide mineralization. Research completed to date includes: 1) a detailed petrographic examination of the vein mineralization associated wallrock alteration and host rocks; 2) whole-rock geochemical analyses of wallrock alteration associated with vein mineralization indicates a narrow halo of Na, K depletion and enrichment in Mg + Fe; 3) analyses of chlorite occuring within the alteration halo and comparison with known trends around massive sulfide deposits; 4) determination of FeS content of sphalerite in the vein system; and 5) measurement of salinity and homogenization of fluid inclusions in quartz precipitated within the veins.

575. GAGNON, R., GAUTHIER, M., GOULET, N., CIMON, J., CLARK, T., Univ. Québec à Montréal, Québec Ministère Énergie et Ressources:
Gîtologie de plusieurs gîtes polymétalliques près du lac Gériod, Nouveau-Québec, 1983-85; thèse de maîtrise (Gagnon).

Connaissance des contrôles sur l'emplacment des gîtes polymétaliques près du lac Gérido, Fosse du Labrador: cartographie géologique, études structurales, échantillonage, autres études gîtologiques.

576. GANDHI, S.S., Geol. Surv. Can.:
Geology of uranium resources of Canada, British Columbia – District of Mackenzie, 1977-.

577. GAUTHIER, M., BROWN, A.C., École Polytechnique (Génie minéral):
Metallogeny of stratiform zinc mineralization in the Grenville Supergroup of the Maniwaki-Gracefield district, Quebec, 1978-82; Ph.D. thesis (Gauthier).

Determination of the lithostratigraphic controls of stratiform zinc mineralization in the Grenville Supergroup.

578. GÉLINAS, L., CIMON, J., Québec Ministère Énergie et Ressources:
Rhyolite de Rouyn, Québec, 1983-84.

Etablir les relations génétiques entre les minéralisations de Cu-Zn et les complexes rhyolitiques dans la région de Rouyn-Noranda.

579. GHAZBAN, F., FORD, D.C., McMaster Univ. (Geology):
Karstic features and stable isotopic studies of the Main Ore body at Nanisivik, Baffin Island, Arctic Canada, 1981-83.

The Main Ore body at Nanisivik is a strata-bound massive sulphide deposit with a near-horizontal ceiling and extending 3 km to strike through steeply dipping Helikian dolomites. Studies of the sulphide-wallrock contacts in the mine strongly suggest that the ore cavity is of the paragenetic cave type and syngenetic, being excavated by ore fluids dissovling upwards to a piezometric surface.

Morphometric studies are completed. O & S isotopic studies of wall rocks, selected sulfide and secondary dolomite layers are commencing. The mine is in a permafrozen state: O isotope values in ground ice ice show regional trends believed to represent successive groundwater injections from the base of a past glacier.

580. GIRARD, A., ASSAD, P., CIMON, J., CLARK, T., Univ. Laval (Géologie), Québec Ministère Énergie et Ressources:
Gîtologie des indices cuprifères du lac Wapanikskan, Fosse du Labrador, Québec, 1983-85.

Connaissance des contrôles sur l'emplacement des gîtes minéraux cuprifères de la région du lac Wapanikskan, Fosse du Labrador. Cartographie détaillée, échantillonnage, autres études gîtologiques.

581. GOOD, D.J., NALDRETT, A.J., SCOTT, S.D., GORTON, M.P., Univ. Toronto (Geology):
Petrology and petrogenesis of the Bucko Lake nickel deposit, Thompson Nickel Belt, Manitoba, 1982-84; M.Sc. thesis (Good).

The Bucko Lake Nickel Deposit consists of disseminated to net textured mineralized zones within a differentiated, folded and altered ultramafic body of komatiitic affinity. Within the ultramafic body, and unknown in other deposits of the nickel belt, is a peculiar plagioclase amphibolite lense with important amounts of remobilized nickel/copper sulfide ore. The aim of this project is to sort out the relationship between the plagioclase amphibolite and the ultramafic body.

582. GROSS, G.A., Geol. Surv. Can.:
Geology and evaluation of iron and manganese resources, 1957-.

583. HAMILTON, W.N., Alberta Research Council (Geol. Surv.):
Mineral resources studies, Alberta, 1979-.

See:
Salt and gypsum in Alberta; CIM Bull. vol. 75, no. 846, p. 73-89, 1982.

Subprojects dealt with in 1982 include: 1) salt and gypsum – completion of report for publication and oral presentation; and 2) Economic Minerals map of Alberta – a compilation of all significant known deposits for map presentation in terms of size, geologic setting and origin, industrial size, and present or past exploitation. Map editing in progress.

584. HARPER, C.T., Saskatchewan Geol. Surv.:
Uranium metallogenic studies, Dawn Lake property, Saskatchewan, 1982.

See:
Saskatchewan Geol. Surv., Misc. Rept. 82-4, p. 46-50, 1983.

Geology of the Carswell structure, central part; Saskatchewan Geol. Surv., Rept. 214, 1982.

Examination of and documentation of the Dawn Lake orebodies in the Athabasca Basin of northern Saskatchewan through logging and sampling of representative drill hole cross sections of the 11, 11A, 11B and 14 ore zones.

585. HENDERSON, J.R., Geol. Surv. Can.:
Meguma gold in the Ecum Secum-Liscomb area, Nova Scotia, 1982-.

586. KEAN, B.F., Newfoundland Dept. Mines and Energy:
Metallogenic studies of Notre Dame Bay massive sulphides, Newfoundland, 1982-84.

Further studies of Notre Dame Bay ophiolite sulphide deposits will continue into early 1984. Upon completion of the field work and laboratory studies, a final report will be compiled.

587. KEPPIE, J.D., SMITH, P.K., O'BRIEN, B., HAYNES, S.J., Nova Scotia Dept. Mines and Energy:
Meguma Group gold project, Nova Scotia, 1981-84.

The Meguma gold project carried out in southeastern Nova Scotia evaluated the gold deposits as well as the associated stratigraphy, structure, metamorphism and geochronology. The silicate and ore vein mineralization with their crosscutting and structural relationships document the polyphase nature of the gold mineralization. Models proposed to explain the mineralization include exhalites, lateral secretion, metamorphic and plutonic solutions and late stage remobilization along joints and fractures. Structural studies have lead to the discovery of poly-phase deformation during both the Acadian and Hercynian Orogenies which are separated by plutonism and static regional metamorphism. Dynamic metamorphism is associated with each of the structural deformations. Stratigraphic studies have lead to the recognition of correlatable units along strike and across major fold axis. Distinct magnetic horizons aid in effectiveness of possibly more regional correlation.

588. KHEANG, L., GÉLINAS, L., BROWN, A.C., École Polytechnique (Génie minéral):
Fluid inclusion studies of volcanogenic copper-zinc deposits. Millenbach mine, Rouyn-Noranda, Quebec, 1978-83; Ph.D. thesis (Kheang).

Determination of the nature of fluids associated with copper-zinc mineralization in a volcanogenic massive sulfide deposit.

589. KIRKHAM, R.V., Geol. Surv. Can.:
Geology of copper and molybdenum deposits in Canada, 1970-.

590. KISH, L., Québec Ministère Énergie et Ressources:
Uranium dans la fosse du Labrador centrale, Québec, 1979-84.

See:
Uraninite-albite veins from the Mistamisk Valley of the Labrador trough, Quebec; Mineral. Magazine, vol. 44, p. 471-83, 1981.

591. KISH, L., Québec Ministère Énergie et Ressources:
Manganèse dans la fosse du Labrador, Québec, 1983-85.

Evaluation du potentiel manganifère des roches ferrifères de Sokoman, Sous-groupe Ferriman.

592. KLASSEN, R.A., Geol. Surv. Can.:
Uranium drift prospecting techniques; Lower Kazan River area, District of Keewatin, 1975-.

593. KWONG, Y.T.J., ADDIE, G.G., British Columbia Ministry Energy, Mines, Petrol. Res. (Geol. Br.):
Petrology of the Tillicum Mountain gold prospect, British Columbia, 1983-84.

The Tillicum Mountain gold prospect is located 13 km east of Burton in the Arrow Lakes region of the Kootenay District, southcentral British Columbia. Exploratory trenching first revealed several high-grade gold occurrences in the Triassic metasediments of the Midford Group. Subsequent geochemical surveys outlined two northwest-trending belts in the same rock formation with anomalous gold values in soils varying from 100 to 3250 ppb over a strike length of 500 meters. Preliminary petrographic studies of suites of specimens collected from the high-grade Heino-Money Zone suggest that the gold mineralization occurred during the intrusion of the Cretaceous (or Jurassic) Goat Canyon-Halifax Creek granodioritic stock. Contacts along calc-silicate assemblages in the metasediments appear to provide the favourable environment for gold concentration. Further field investigation and sampling will cover the lower grade but more extensive valley zone so that a comprehensive mineralization model can be formulated.

594. KWONG, Y.T.J., HORA, Z.D., British Columbia Ministry Energy, Mines, Petrol. Res. (Geol. Br.):
Titanium minerals in porphyry copper tailings, British Columbia, 1982-84.

To investigate this potential of porphyry copper tailings as a source of titanium in British Columbia. The initial stage of the project involved requisition of composite samples in storage from 12 selected major present and past producing prophyry copper deposits. These sample would be analysed for Ti so that promising suites could be screened for further study. The procedure would involve preparation of heavy mineral concentrate and subsequent analytical and mineralogical examination for TiO_2 minerals and grade. Systematic sampling of tailings at prospective minesites would then follow and the laboratory procedure be repeated to establish the poential recovery of titanium minerals.

595. LACROIX, S., DARLING, R., CIMON, J., CLARK, T., École Polytechnique, Québec Ministère Énergie et Ressources:
Gîtologie des gîtes de Ni-Cu du lac Aulneau, Fosse du Labrador, Québec, 1983-85; thèse de maîtrise (Lacroix).

Connaissance des contrôles gîtologiques sur l'emplacement des gîtes de Ni-Cu au lac Aulneau, Fosse du Labrador; connaissance de la minéralogie des sulfures et de leur altération. Etudes des carottes de sondage, cartographie détaillée, échantillonnage, autres études gîtologiques.

596. LYDON, J.W., Geol. Surv. Can.:
Geology of lead and zinc resources of Canada, 1977-.

597. MACDONALD, A.J., COLVINE, A.C., Ontario Geol. Surv.:
Gold in iron formations, 1982-84.

See:
The MacLeod-Cockshutt and Hard Rock Mines, Geraldton; examples of an iron-formation related gold deposit; Ontario Geol. Surv., Misc. Paper 106, 1982.

To document the occurrences of gold in iron formations of Archean age throughout Ontario and determine the factors controlling and resulting in economic mineralization. Initial work commenced in the Geraldton area, using exposures on the Hard Rock and MacLeod Cockshutt past producing mines. Subsequent studies will include examination of the Central Patricia and Pickle Crow past producing mines and possibly the Opapimiskan deposit and Detour Lake Mine (production anticipated September 01, 1983).

598. MACDONALD, D.E., MORTON, R.D., Alberta Research Council (Geol. Surv.), Univ. Alberta (Geology):
Phosphate evaluation study, 1978-83; M.Sc. thesis (Macdonald).

All of the fieldwork has now been completed and the final report is currently being prepared.

599. MACDONALD, D.W.A., McALLISTER, A.L., Univ. New Brunswick (Geology):
Breccia sulphides at the Health-Steele Mines, New Brunswick, 1981-83; M.Sc. thesis (MacDonald).

600. MACINTYRE, D.G., British Columbia Ministry Energy, Mines, Petrol. Res. (Geol. Br.):
Stratiform massive sulphide deposits northern British Columbia, 1979-.

Recently discovered stratiform massive sulphide deposits in northern British Columbia include those of the Gataga District and the Midway and Windy Craggy deposits. Field work will continue in these areas with the main objective being a refinement of data on the stratigraphic and structural settings of the deposits. Lithogeochemical and micropaleontological studies are currently in progress. Areal mapping will be curtailed until funding of projects improves.

601. NALDRETT, A.J., BORTHWICK, A.A., Univ. Toronto (Geology):
Platinum group elements in layered intrusions, 1981-84; M.Sc. thesis (Borthwick).

The geology and petrology of the Big Trout Lake layered intrusion, northwestern Ontario is being studied to determine its nature and origin. A detailed investigation of the petrography is used to complement a geochemical study. Major trace, rare earth, and platinum group element data has been obtained. This information will help address two aspects of particular interest. This investigation will focus on the behaviour of platinum group elements during the differentiation of the intrusion. Secondly, the work will provide valuable documentation of an Archean layered intrusion.

602. PEARSON, J.G., Saskatchewan Geol. Surv.:
Gold metallogenic studies, Saskatchewan, 1979-83.

See:
Gold metallogenic studies: Amisk Lake East area; Saskatchewan Geol. Surv., Misc. Rept. 82-4, p. 64-75, 1982.

Five gold occurrences in the Amisk Lake East area were mapped in detail and sampled for geochemical and petrographic studies. Although they are in different rock types, the occurrences show common features being associated with quartz carbonate veins which are for the most part northwesterly trending and show envelopes of alteration comprising carbonatization, silicification and tourmalinitization.

603. PERRAULT, G., TRUDEL, P., BÉDARD, P., École Polytechnique (Génie minéral):
Dispersion de l'or autour des gîtes de la mine Lamaque, Val d'Or, Québec, 1982-83.

604. PLANTE, L., CIMON, J., GAUTHIER, M., Univ. Québec à Montréal, Québec Ministère Énergie et Ressources:
Indices de Cu Co Ni Rivière Hart Jaune, Manicouagan Québec, 1983-84; these de maîtrise (Plante).

Définir le potentiel économique d'indices de Cu Co Ni. Etablir leur paragenèse à leur cadre géologique et structural.

605. ROBERT, F., BROWN, A.C., École Polytechnique (Génie minéral):
Metallogeny of gold in the Sigma mine, Val d'Or, Quebec, 1980-83.

See:
Structural control of gold mineralization at the Sigma mine, Val d'Or, Quebec; CIMM Bulletin, no. 839, vol. 75, p. 109, 1982.

Determination of the structural environment and timing of gold mineralization at the Sigma mine.

606. ROSCOE, S.M., Geol. Surv. Can.:
Metallogeny of the northwestern part of the Canadian Shield, 1977-.

607. RUITENBERG, A.A., New Brunswick Dept. Nat. Res. (Mineral Development Br.):
Gold deposits in the Bay of Fundy coastal zone, New Brunswick, 1982-84.

Gold-bearing rocks in the Cape Spencer area, along the Bay of Fundy coast, were examined. The host rocks were previously assigned to the Carboniferous Mispeck Group, but they are probably Precambrian or early Cambrian. The unaltered rocks in the map-area are greenish and purplish grey slate, siltstone and sandstone, which are locally

intruded by granite. The finer grained sedimentary rocks show a well-defined penetrative cleavage (S_1), which in places is cut by a second cleavage (S_2). The penetrative fabric is cut by prominent thrust faults within and immediately east of the mineralized zone. The gold occurs both in quartz veins and the intensely silicified, sericitized and pyritized wall rocks. Hematite is generally abundant in the gold-bearing veins which are of highest grade in the granite. Gold-bearing structures similar to those at Cape Spencer were found in several other localities east and west of Saint John.

608. RUZICKA, V., Geol. Surv. Can.:
Geology of uranium and thorium resources of Canada, 1975-.

See:
Notes on mineralogy of various types of uranium deposits and genetic implications; Geol. Surv. Can., Paper 82-1A, p. 341-349, 1982.

609. SANGSTER, D.F., Geol. Surv. Can.:
Geology of lead and zinc deposits in Canada, 1965-.

610. SCHROETER, T.G., PANTELEYEV, A.P., British Columbia Ministry Energy, Mines, Petrol. Res. (Geol. Br.):
1) Geology and mineralization at Equity Silver Mine, Houston, British Columbia; 2) Epithermal mineralization in British Columbia; 3) Regional metallogeny, northern British Columbia, 1973-.

611. SCOTT, S.D., KALOGEROPOULOS, S.I., URABE, T., HATTORI, K., Univ. Toronto (Geology):
U.S.-Japan-Canada co-operative study of volcanogenic massive sulfide deposits, 1978-83; Ph.D. thesis (Kalogeropoulos).

We are examining the Seneca (Jurassic; British Columbia), South Bay (Archean; Ontario) and Noranda district (Archean; Quebec) deposits, concentrating on the footwall alteration of massive sulfides and the geochemistry of their associated tuffaceous exhalites.

612. SINCLAIR, W.D., Geol. Surv. Can.:
Geology of copper and molybdenum resources of Canada, 1977-.

613. SPRINGER, J.S., CHERRY, M.E., ANDREWS, A.J., MACDONALD, A.J., Ontario Geol. Surv.:
Features of gold concentration in Precambrian settings, 1981-83.

Particular work will continue on the association of gold with carbon, on gold ores with arsenic, antimony and selenium, and on gold in pyrite and arsenopyrite.

614. THORPE, R.I., Geol. Surv. Can.:
Geology of silver and gold deposits in Canada, 1968-.

615. TORTOSA, D., LANGFORD, F.F., Univ. Saskatchewan (Geological Sciences):
Geology of the Cenex Mine, northern Saskatchewan, 1979-83; M.Sc. thesis (Tortosa).

616. TREMBLAY, L.P., Geol. Surv. Can.:
Geology of uranium resoruces of Canada, 1975-.

See:
Geology of the uranium deposits related to the sub-Athabasca unconformity, Saskatchewan; Geol. Surv. Can., Paper 81-20, 1982.

Some chemical aspects of the regolithic and hydrothermal alterations associated with the uranium mineralization in the Athabasca Basin, Saskatchewan; Geol. Surv. Can., Paper 83-1A, p. 1-14, 1983.

617. TROOP, D.G., SCOTT, S.D., Univ. Toronto (Geology):
Geochemistry relations between stratabound Pb-Zn sulphides and banded iron Formations, and altered footwall volcanic rocks, Flat Landing Brook, New Brunswick, 1981-83; M.Sc. thesis (Troop).

The Flat Landing Brook deposit is a small sub-economic stratabound volcanic-hosted Pb-Zn sulphide deposit occuring in the Ordovician Tetagouche group of Northern New Brunswick. The form, composition and enclosing stratigraphic sequence are grossly similar to that of the Brunswick No. 12 deposit (approx. 7 miles due north).

A unique feature of FLB is the near perfect facies transition from Pb-Zn sulphides to banded iron formations along the ore horizon. As these iron formations are postulated to represent equivalents to precursor exhalative chemical sediments deposited about the margins of the massive sulphide body, their chemistry may be related to evolved hydrothermi solutions.

Mineralogically, the oxide, silicate and carbonate iron formations show similar assemblages to those of Archean and Proterozoic BIFs. Progressive alteration of the footwall rocks towards the orebody gives an indication of the composition of the ore solutions and possible hydrothermal contributions to the BIF bulk composition. Significant enrichements in Fe, Mg, Mn, and volatiles and depletions in Si, Ti, P, Zr, Rb, Sr, and alkalis essentially immobile behaviour – thus providing a monitor of detrital input along the ore horizon. Preliminary results for the BIFs indicate that Ca, Mn, P, Pb, Ti and Zr cannot be accounted for by detrital input and must be partly hydrothermal in origin. Currently, iron formations and associated rocks are being analyzed for various trace elements by neutron activation analysis.

618. WATKINSON, D.H., WHITTAKER, P.J., Carleton Univ. (Geology):
Geology, petrology and chromite chemistry of Cr occurrences in ophiolitic complexes, British Columbia, 1980-83; Ph.D. thesis (Whittaker).

Field mapping in central British Columbia was completed for this three-year project with a study of Murray Ridge, Pinchi Mountain and Mt. Sydney Williams. These and the Mitchell Range ultramafic rocks have a variety of chromite occurrences that have been described and interpreted; chromite is very Cr-rich, generally containing greater than 55% Cr_2O_3. There is little difference in chemical composition of chromite from disseminated, occluded-silicate, net-textured and massive textural types. Most chromite, except disseminated types, contain abundant inclusions of serpentinized olivine, pyroxenes, paragasitic amphibole, various base-metal sulfides and laurite, as well as fluid inclusions. Chormite has apparently equilibrated with magma and a fluid phase rich in sodium.

PETROLEUM EXPLORATION/EVALUATION/ RECHERCHE ET ÉVALUATION DES GÎTES DE PÉTROLE

619. BAILEY, B., BOOTH-HORST, R., PALONEN, P.A., Ontario Geol. Surv.:
The evaluation of Ontario conventional and potential oil and gas reserves study, 1982-86.

To provide an evaluation of the conventional and potential oil and gas reserves of the Paleozoic strata of Ontario. The project is divided into evaluation of 1) Ordovician, 2) Cambrian, 3) Devonian, 4) Silurian on sandstone play, 5) Silurian reef complex, 6) James Bay-Hudson Bay Lowlands of Ontario, and 7) final report.

620. CANT, D.J., MOSSOP, G.D., Alberta Research Council (Geol. Surv.):
Petroleum geology, northwestern Alberta, 1980-83.

See:
The Spirit River Formation – a stratigraphic-diagnostic gas trap in the deep basin of Alberta; Bull. Amer. Assoc. Petrol. Geol., vol. 67, no. 4, p. 577-587, 1983.

To develop an understanding of the distribution of reservoir rock in the Spirit River Formation, in Alberta's Deep Basin a major gas producer. The project involves subsurface facies analysis because the reservoirs are stratigraphic traps.

621. CANT, D.J., MOSSOP, G.D., Alberta Research Council (Geol. Surv.):
Petroleum geology, northwestern Alberta, 1983.

To develop an understanding of the distribution of oil reservoirs in Triassic rocks in western Alberta, involving facies anlaysis and diagenetic studies.

622. COLEMAN, L.C., NISBET, E.G., STAUFFER, M.R., ARNDT, N.T., Univ. Saskatchewan (Geological Sciences):
Geochemical studies of Aphebian volcanic rocks in the vicinity of Flin-Flon, Manitoba-Saskatchewan, 1982-85.

Detailed mapping and geochemical sampling has been carried out near Flin Flon, in the Aphebian Amisk volcanics of Saskatchewan and Manitoba. Samples from the area have been studied petrographically, chemically analyzed for major and trace elements and selected minerals have been analyzed by electron microprobe. In the second phase of the project it is intended to build up a detailed picture of the Amisk volcanic complex and its geochemical setting. This will involve further petrographic and chemical studies and co-operation with a team of workers from the Max Planck Inst., Germany, who expect to carry out field work in the area in 1983. Particular attention will be paid to isotopic and trace element compositions of the volcanics.

623. DENSMORE, A.A., Geol. Surv. Can.:
Petroleum geology of Tertiary, Mesozoic and Paleozoic strata, north of 70°, District of Franklin, 1975-.

624. DIETRICH, J.R., Geol. Surv. Can.:
Petroleum geology of Tertiary, Mesozoic and Paleozoic north of 68° on the NWT and Yukon mainland and offshore, 1975-.

625. FOSCOLOS, A.E., Geol. Surv. Can.:
Diagenesis of organic matter and clay minerals in sediments in relation to petroleum generation, 1975-.

626. FOSCOLOS, A.E., Geol. Surv. Can.:
Fluid rock interaction in sandstones, 1980-.

627. GOODARZI, F., Geol. Surv. Can.:
Temperature history of Lower Paleozoic rocks, determined by optical study of dispersed organic materials, 1982-.

628. GRANT, A.C., Geol. Surv. Can.:
Geological interpretation of geophysical data as an aid to basin synthesis and hydrocarbon inventory, 1974-.

629. HÉROUX, Y., ACHAB, A., INRS-Géoressources:
Relations entre l'évolution thermique des matières organiques (Kérogènes) et la géologie structurale des Appalaches du Québec, 1982-85.

Établir les relations entre l'évolution thermique et structurale de l'extrémité est de la péninsule de Gaspé; comparer le comportement des pouvoirs réflecteurs des

pyrobitumes, des <<réservoirs bitimena>> et localement des charbons. L'étude de la composition des kérogènes servira, dans un premier temps, à établir la nature des <<bitumes>> (pyro- et réservoirs) et préciser leur niveau de maturation.

630. KALKREUTH, W.D., Geol. Surv. Can.:
The relationship between kerogen (type and rank) and chemical extract data, for the purpose of source rock evaluation, 1977-.

631. MIALL, A.D., SCHWERDTNER, W.M., NORRIS, G., CHOWDHURY, A., ELLINGHAM, E., Univ. Toronto (Geology):
Basin analysis of petroleum-bearing strata, 1980-84; M.Sc. thesis (Ellingham).

Field work on Upper Cretaceous and Paleogene sediment (Eureka Sound Formation) of the Canadian Arctic Islands, was completed in 1980. Synthesis of the depositional environments and paleogeography of this fluvial-deltaic-shallow marine unit is continuing. Studies of regional geology are being carried out in an attempt to clarify the nature and timing of the syn-depositional Eurekan Orogeny and its bearing on the plate tectonic history of northern North America and Greenland. Other work on Sverdrup Basin includes various stratigraphic-sedimentologic studies, currently focussing on the Permian-Carboniferous Canyon Fiord Formation (Ellingham).

632. PROCTER, R.M., Geol. Surv. Can.:
Enhanced oil recovery research, 1982-.

633. TELFORD, P.G., JOHNSON, M.D., RUSSELL, D.J., Ontario Geol. Surv.:
Ontario oil shale resource assessment project, 1982-.

A study of the potential hydrocarbon resources which can be produced from the black Paleozoic shale units in Ontario. Three units are being analyzed in detail: Ordovician Whitby Formation, and Devonian Kettle Point and Marcellus formations. Field study is backed with the drilling of over 6400 m of drill core, geophysical logging, petrochemical anlayses and engineering testing.

634. WARDLAW, N.C., Univ. Calgary (Geology and Geophysics):
Pore systems in porous media and reservoir rocks on oil and gas production, 1978-84.

Sees
The effects of geometry, wettability, viscosity and interfacial tension on trapping in single pore-throat pairs; J. Can. Petrol. Technology, vol. 21, p. 21-27, 1982.

Experiments in physical models and core as an aid in understanding mechanisms of enhanced recovery of conventional oil; in Advances in Petroleum Recovery, Upgrading and Technology, Alberta Oil Sands Technology Res. Authorities 3rd Ann. Conf., p. 1-20, 1982.

A method of making two dimensional glass micromodels of pore systems; J. Can. Petrol. Technology, vol. 21, p. 1-3, 1982.

Load-perpendicular cataclastic fabric in experimentally deformed limestone; in Atlas of Deformational and Metamorphic Rock Fabrics, Springer Verlag, p. 392-393, 1982.

The efficiency with which oil and gas can be displaced from a reservoir is dependent on the nature of the fluids and the geometric and topologic aspects of the pore systems. Recovery efficiency (oil displaced as a % of oil in place) varies widely, and a major objective of the project has been to understand how the geometry of pore systems influence recovery efficiency.

Recovery efficiency is usually estimated by means of multiphase (water-oil or water-gas) relative permeability tests which are performed on core samples. These tests are difficult and expensive and are rarely made under reservoir conditions of temperature, pressure, displacement rate and wettability.

There is a need for simpler techniques of estimating recovery efficiency in order to be able to process a larger number of samples which could more adequately represent the heterogeneous reservoir. There is also a need to identify those aspects of pore systems which are critically important in their effect on recovery efficiency. The major objective of the project has been to identify and evaluate these properties. Without some understanding of this, it is difficult to assess how representative the few samples chosen for relative permeability tests are of the reservoir as a whole.

635. WILLIAMS,, G.L., Geol. Surv. Can.:
Maturation studies, 1981-.

636. YOLE, R.W., SYKORA, J., ADAMS, P., Carleton Univ. (Geology):
Stratigraphic, pertrographic and diagenetic studies of subsurface Mesozoic and Tertiary deltaic sequences, northern and eastern Canada, 1977-84; M.Sc. thesis (Sykora), B.Sc. thesis (Adams).

Sees
Sedimentary petrology and stratigraphic analysis of the subsurface Reindeer Formation (Early Tertiary), Mackenzie Delta – Beaufort Sea, Canada; Can. Soc. Petrol. Geol., Mem. 8, p. 55-82, 1982.

Diagenesis of Reindeer Formation sands is being studied by Adams, with particular emphasis on carbonate cements and diagenetic sequence. The petrography and diagenesis at Parsons Group sandstones (Cretaceous, Mackenzie-Beaufort area) are being investigated by Sykora. Combined with the earlier studies on Cretaceous sands of the Scotian Shelf (Yuan), refinement of sedimentation and diagenetic models of deltaic sequences will be attempted.

GENERAL/GÉNÉRALITÉS

637. ALLDRICK, D.J., CARLYLE, L.W., McMILLAN, W.J., British Columbia Ministry Energy, Mines, Petrol. Res. (Geol. Br.):
Mosquito Creek project (NTS 93H), British Columbia, 1982-83.

Deposits of this mining camp in east-central British Columbia occur in a predominantly clastic metasedimentary sequence of Upper Paleozoic age. Lower Jurassic regional deformation and associated greenschist facies metamorphism produced a series of northwest-trending overturned folds. Gold mineralization occurs as auriferous pyrite in two structural settings: (1) higher grade stratabound massive pyrite lenses within or at the contacts of limestone units, (2) lower grade pyritic quartz veins cross-cutting the structural footwall rocks.

Within the Mosquito Creek mine, detailed mapping has identified two local marker units useful for tracing ore lenses in this intensely faulted environment. Studies have documented characteristic peripheral alteration features around the pyrite lenses which may aid exploration for these numerous small but high grade gold orebodies. Alteration includes pervasive sericitization with locally developed silicification. Peripheral accessory minerals are arsenopyrite, galena, sphalerite, mariposite and rare pyrrhotie.

Stratigraphic relationships, major and trace metal associations and radiometric dates indicate that the deposits are epigenetic.

Continuing studies include ore and host rock petrology, geochemical relationships, fossil and radiometric dating.

638. ARCHIBALD, C.W., C.W. Archibald Ltd., Ontario Geol. Surv.:
Optimization of vibratory coring drill performance for improving overburden sampling, 1982-84.

To refine the field performance of an overburden vibratory coring drill so it may be applied to geochemical soil till sampling and geophysical probing. In certain situations this drill provides complete, continuous and undisturbed samples of unconsolidated overburden. Research investigation will attempt to quantitively assess the performance of the overburden drill and where feasible, modifications will be implemented to optimize field performance of commercially available units.

639. ASSELIN, P., Québec Ministère Énergie et Ressources:
Région du Lac Gaudreault, Nord-Est du Québec, 1982-89.

Les objectifs généraux de l'étude sont de répondre à la question de savoir si les pyroclastistes felsiques de la région du Lac Gaudreault offrent un potentiel pour la découverte de gisements économiques de métaux de base.

640. CHEVÉ, S., SCHRIJVER, K., CIMON, J., CLARK, T., INRS, Québec Ministère Énergie et Ressources:
Gîtologie du Centre-Nord de la Fosse du Labrador (Région des lacs Romanet-Dunphy), Québec, 1982-84.

Cartographie détaillée des indices à l'ouest du lac Romanet, études gîtologiques: cartographie détaillé des indices près du lac Dunphy, études gîtologiques.

641. CHURCH, B.N., British Columbia Ministry Energy, Mines, Petrol. Res. (Geol. Br.):
Geology and mineralization in the Buck Creek caldera, central British Columbia, 1980-.

Sub-circular distribution of upper Cretaceous rhyolite beds in the Buck Creek area of central British Columbia is believed to delineate a caldera structure containing lower Tertiary moat volcanics and a central resurgent dome in vicinity of the Equity Mine near Goosly Lake. A prominent 30-kilometre-long lineament, radial to the resurgent centre, connects the Equity and Silver Queen Mines and a series of feeder plugs to the Eocene lavas.

Weak porphyry copper and molybdenum mineralization is associated with upper Cretaceous granitoid intrusions and rhyolites on the rim and central area of the structure. Younger copper-lead-zinc vein deposits and higher temperature hydrothermal silver-copper rich fillings, disseminations and replacements are correlated to the Tertiary igneous events and resurgence.

These fresh evaluations are based on a synthesis of volcanic geology, new structural data and regional geochemistry covering an area of more than 3000 square kilometres between Francois Lake, Houston and Burns Lake.

642. CLARK, T., Québec Ministère Énergie et Ressources:
Gîtologie du Centre-Nord de la Fosse du Labrador (région des Lacs Mistamisk – Romanet – Otelnuc – Patu), Québec, 1982-85.

1° été de complété, surtout de la cartographie; 2° été de cartographie et de gîtologie à faire.

643. DARLING, R., École Polytechnique (Génie minéral), Univ. Montréal (Géologie):
Geology of the manganese occurrences in the Schefferville region, Québec, 1982-83.

644. DAWSON, K.M., Geol. Surv. Can.:
Metallogeny of the northern Canadian Cordillera, 1978-.

Sees
Regional metallogeny of the northern Cordillera: biostratigraphy, correlation and metallogenic significance of bedded barite occurrences in eastern Yukon and western District of Mackenzie; Geol. Surv. Can., Paper 82-1C, p. 31-38, 1982.

645. DEAN, P.L., MEYER, J.R., Newfoundland Dept. Mines and Energy:
An assessment of the mineral potential of sedimentary basins in Newfoundland, 1982-84.

Continuing field studies with follow-up in 1983. Two open file releases planned for 1983. Report in late '84 or early '85.

646. DUNSMORE, H.E., Geol. Surv. Can.:
Metallogenic process in sedimentary environments, 1982-.

647. EASTWOOD, G.E.P., British Columbia Ministry Energy, Mines, Petrol. Res. (Geol. Br.):
Leech River area, Vancouver Island, British Columbia, 1981-82.

Sees
Leech River area, Vancouver Island (92B/5g, 12/b-c); British Columbia Ministry of Energy, Mines, Petrol. Res., Paper 1982-1, p. 70-74, 1982.

Mapping of the Leech River Formation in its type area was undertaken in 1981 and 1982 to provide a stratigraphic and structural framework for the continuing search for the source of placer gold and to attempt to place the formation in the chronology of Vancouver Island. The formation is in fault contact with the younger Metchosin Formation on the south, and the 1981 mapping indicated that the fault dips south and the Metchosin has been upthrust. Detailed mapping of Martins Gulch showed that the beds face north and that sedimentation was generally cyclical from fine sand to clay and back, punctuated by a few episodes of volcanism. The sands and silts have been deformed and metamorphosed to dragfolded quartzite and siltite, and the clays to black phyllitic or schistose argillite. Sections to the east indicate some magascopic folds but an overall north facing of the Leech River Formation. It is overlain by a thicker volcanic unit, Clapp's Malahat volcanics, that is increasingly granitized northward and passes gradationally to Jurassic Colquitz quartz diorite. Of the pre-Jurassic units the Leech River and Malahat most nearly resemble the Sicker Group. Some quartz veins are pyritic, but visible gold was not found.

648. EASTWOOD, G.E.P., McMILLAN, W.J., British Columbia Ministry Energy, Mines, Petrol. Res. (Geol. Br.):
Sicker project – Big Sicker Mountain, Vancouver Island, British Columbia, 1978-83.

In 1982 mapping was extended to the Lenora-Tyee mine and over the summit of Big Sicker Mountain. The orebodies occurred in a vein zone in one of three schist belts passing through the mountain. This belt is truncated by shonkinite underlying Little Sicker Mtn. and was not identified on Mount Richards. A second belt contains considerable disseminated pyrite which is reported to be copper-bearing; it appears to peter out at both ends. The third and most northerly belt has been traced from the Chemainus River across the north slope of Big Sicker and east almost to Crofton. The schistosity is transected by unsheared shonkinite dykes. This belt also contains considerable disseminated pyrite, but only trace amounts of copper. Both the mine and north belts contain lenses of black argillite, schistose in part; they do not appear significant for the mineralization. Near the vein the schistosity has been warped and folded, and a flanking shonkinite dyke has in part been sheared. Apparently the mine belt was re-opened by post-shonkinite movement, permitting ingress of mineralizing solutions. A K-Ar age of 363 ± 13 Ma was obtained on a hornblende separate from a shonkinite dyke, and therefore the schisting and the Sicker Group are Middle Devonian or older.

649. FAULKNER, E.L., British Columbia Ministry Energy, Mines, Petrol. Res. (Geol. Br.):
Preparation of introductory prospecting manual and instructor's guide, 1982-83.

To prepare a manual for Ministry Personnel for use in introductory prospecting classes, to consist of set of student notes and an instructor's manual.

650. FRANKLIN, J.M., Geol. Surv. Can.:
Metallogeny of the southwestern part of the Canadian Shield, 1975-.

651. FRANKLIN, J.M., Geol. Surv. Can.:
Metallogeny of marine environments, including active spreading rides, 1982-.

652. GOYER, M., LANGLAIS, L., FOREST, G., BOULÉ, C., Québec Ministère Énergie et Ressources:
Région de la faille du Grand Pabos, Gaspésie, Québec, 1981-84.

Fournir à l'industrie minière des données géologiques tactiques dans le secteur immédiat de la faille du Grand Pabos.

653. GROSS, G.A., Geol. Surv. Can.:
Geology of mineral resources in the ocean, 1976-.

654. HOFFMAN, E.L., Nuclear Activation Services Ltd., Ontario Geol. Surv.:
Determination of short-lived isotopes by neutron activation analysis and investigation of commercial viability of prompt gamma analysis, 1981-84.

Development of a commercial activation analysis facility for shortlived radioisotopes for use by the mining industry. The investigation of the feasibility of establishing a prompt gamma facility on a commercial basis also for use by the mining industry.

655. HOY, T., British Columbia Ministry Energy, Mines, Petrol. Res. (Geol. Br.):
Mineral deposits, sedimentation and tectonics of Proterozoic Purcell Supergroup, southeastern British Columbia, 1977-83.

Sees
The Purcell Supergroup in southeastern British Columbia; sedimentation, tectonics, and stratiform lead-zinc deposits; Geol. Assoc. Can., Sp. Paper 25, 1982.

Stratigraphic and structural setting of stratabound lead-zinc deposits in southeastern British Columbia; CIMM Bull. no. 75, p. 114-134, 1982.

Geology of the Moyie Lake ara; British Columbia Ministry of Energy, Mines, Petrol. Res., Prel. Map 49, 1982.

The project focuses on the relationship between stratabound lead-zinc deposits, including the Sullivan deposit at Kimberley, and sedimentation and tectonics. It includes regional mapping, at 1:50,000 scale, and detailed section measurements.

656. MARMONT, S., COLVINE, A.C., Ontario Geol. Surv.:
Felsic intrusion related mineralization, Ontario, 1980-83.

Write-up of a final report on the "Archean Porphyry Deposits" and a report on the geology, geochemistry and petrography of the Terrace Bay Batholith.

657. MILLER, A.R., Geol. Surv. Can.:
Metallogeny of the Baker Lake – Thelon region, Northwest Territories, 1981-.

658. MORIN, G., CIMON, J., GAUTHIER, M., Univ. Québec à Montréal, Québec Ministère Énergie et Ressources:
Géologie et métallogénie de la région de Montauban, Québec, 1983-84; thèse de maîtrises (Morin, Gauthier).

Orégine génétique des gîtes de Pb-Zn Au de la région visée. Etude lithologique et structurale afin de terminer des contrôles de la minéralisation et la morphologie des gîtes.

659. NALDRETT, A.J., EVENSEN, N.M., BHAGAVATULA, V.R., Univ. Toronto (Geology):
Contamination and the genesis of the Sudbury Nickel ores, Ontario, 1982-85.

To study the extent to which contamination by the crustal rocks has affected the composition of the igneous sublayer, main norite and micropegmatite at Sudbury, and relate the degree of contamination to the composition of ores associated with different units of the sublayer. The existence of such relationship will provide strong evidence that contamination has played a role in generating the Sudbury ores and carries important implications with respect to further exploration at Sudbury and elsewhere.

Major, trace (including REE) element study was carried out to understand fully the chemistry of various units of the main irruptive and the sublayer. Further work on Rb-Sr, Nd-Sn isotope analysis is in progress.

660. PANTELEYEV, A.P., SCHROETER, T.G., DIAKOW, L.J., British Columbia Ministry Energy, Mines, Petrol. Res. (Geol. Br.), Univ. Western Ontario (Geology):
A comparative study of precious metal deposits and related hydrothermal alteration zones in the 'Toodoggone Volcanics', northwestern British Columbia, 1982-85; Ph.D. thesis (Diakow).

Systematic mapping of Toodoggone Volcanics started in 1981, continued in 1982 and will carry on in 1983. Particular attention was paid to interpreting the depositional environment and structural evolution of the mainly subaerial volcanic assemblage and subdivising the rocks into lithostratigraphic map units.

Extensive suites of hydrothermally altered and mineralized rocks were collected for petrologic and chemical anlaysis. Fluid inclusion, radiometric and stable isotope anlaysis will be done. The data will be used to define the hydrothermal regimes that caused major zones of hydrothermal alteration and attendant epithermal precious metal deposition.

661. PILOTE, P., CIMON, J., Univ. Québec à Chicoutimi, Québec Ministère Énergie et Ressources:
Gîtologie de la région du lac Berrigan, Chibougamau, Québec, 1983-84; thèse de maîtrise (Pilote).

Classification morphologique et génétique des indices dans la région du lac Berrigan à Chibougamau. Contrôles stratigraphiques et structuraux.

662. PROCYSHYN, E., CIMON, J., Québec Ministère Énergie et Ressources:
Etudes métallogéniques et structurales en Gaspésie, Québec, 1983-84.

Déterminer l'histoire structurale propre à chacun des principaux gîtes de la Gaspésie. Etablir l'âge relatif de la minéralisation par rapport aux différentes phases de déformations.

663. SAGE, R.P., TROWELL, N.F., WOOD, J., Ontario Geol. Surv.:
Alkalic rock – carbonatites of Ontario, 1978-83.

664. SAGE, R.P., TROWELL, N.F., WOOD, J., Ontario Geol. Surv.:
Geology of the Josephine area, Wawa, Ontario, 1981-83.

See:
Josephine area, District of Algoma; Ontario Geol. Surv., Misc. Paper 106, p. 28-33, 1982.

Preliminary appraisal of alteration of metavolcanics in the Wawa area, District of Algoma; ibid., p. 34, 35, 1982.

665. SCHRIJVER, K., TASSÉ, N., HÉROUX, Y., ACHAB, A., DESJARDINS, M., INRS-Géoressources:
Métallogénie de la séquence carbonatée des Basses Terres du Saint-Laurent: contribution à l'évaluation du potentiel minéral de la plate-forme Cambro-Ordovicienne, 1983-.

L'objectif du projet est de préciser le potentiel métallogénique des Basses Terres du Saint-Laurent par une étude exhaustive de la géochimie des séquences carbonatées.

666. SOUTHER, J.G., Geol. Surv. Can.:
Geothermal energy resources in Canada, 1973-.

667. SPRINGER, J.S., CARTER, T.R., MELCZAK, J., Ontario Geol. Surv.:
Inventory of base and precious metal deposits in the Grenville Province south of 45° and east of 78°, Ontario, 1982-83.

Complete modern inventory of data available (maps, reports, assessment work, literature sources) for base and precious metal occurrences. Map at 1:250,000 to display location.

668. THOMAS, P., FYSON, W.K., Univ. Ottawa (Geology):
Structures and mineral deposits of the Cordova gabbro, Grenville Province, Ontario, 1981-83; M.Sc. thesis (Thomas).

669. WARES, R., CIMON, J., WILLIAM-JONES, W., WILLIAMS-JONES, A.A., McGill (Geological Sciences), Québec Ministère Énergie et Ressources:
Synthèse gîtologique de la région de Sullipek, Canton Hesseps, Gaspésie, Québec, 1983-84; thèse de doctorate (Wares).

Cartographie détaillée dans le voisinage de zones minéralisées sur la partie de la région de Sullipek. Vérification par sondage des hypothèse postulés.

MINERALOGY/CRYSTALLOGRAPHY/MINÉRALOGIE/CRISTALLOGRAPHIE

670. ADSHEAD, J.D., Geol. Surv. Can.:
Mineralogy and geochemistry of the unconsolidated cover – Central Arctic, 1976-.

671. ANDERSON, A.J., CERNY, P., Univ. Manitoba (Earth Sciences):
Geochemistry and petrology of the Cross lake pegmatite field, Manitoba, 1981-84; M.Sc. thesis (Anderson).

Mineralogical, geochemical and petrogenetic study of a pegmatite field with a wide range of barren to highly mineralized pegmatites. Study of relationship to regional structures, metamorphism and igneous intrusions.

672. BALL, N.A., FERGUSON, R.B., Univ. Manitoba (Earth Sciences):
Characterization of some high-temperature alkali feldspars in the sanidine-anorthoclase-high albite series, 1981-83.

673. BRACKMANN, A.J., SCOTT, S.D., Univ. Toronto (Geology):
Diffusion of Zn and Fe in sphalerite, 1981-83; M.Sc. thesis (Brackmann).

Self-diffusion rates of Zn and Fe in sphalerite are being measured by a sectioning technique. Homogeneous, natural sphalerite is cut into pairs of 5 mm cubes, each with one polished face. The source cube is irradiated in a neutron source to produce Zn^{65} and Fe^{59}. The two cubes are then clamped together and heated to a set temperature, in the range 500-800°C, for a measured time. At the end of the run the receptor cube is sectioned. A concentration versus distance profile is produced from which a diffusion coefficient is determined.

Preliminary results of the sectioning work indicate $Do = 1.8 \cdot 10^{-9}$ cm²/s and Q = 14 kcal where $D = Do\ exp(-Q/RT)$. These values differ significantly from the vapour diffusion data in the range 800-1200ç of Secco (1958, 1964). The presence of possible grain-boundary and surface effects is being investigated by the use of the SEM and autoradiographs.

674. CABRI, L.J., LAFLAMME, J.H.G., EMR (CANMET):
Mineralogy of platinum group elements, 1971-83.

See:
Classification of platinum-group element deposits with reference to the Canadian Cordillera; in Precious Metal Deposits in the Northern Cordillera, Assoc. Exploration Geochem., p. 21-31, 1982.

Mineralogy and recovery in precious-metal bearing ores (abstract); CIM Bulletin, vol. 75, no. 842, p. 123, 1982.

Mineralogy and recovery of platinum-group elements from Cu-Ni sulphide ores; I.M.A. XIII General Meeting, Program with Abstracts, p. 397, 1982.

New methods are required for measuring, at very low levels, the precious metal content of major minerals in ore deposits. The accurate metal balances needed for efficient recovery are being sought by new in-situ analysis procedures. These involve a proton microprobe, an ion probe and a tandem mass accelerator.

675. CABRI, L.J., LAFLAMME, J.H.G., EMR (CANMET):
Mineralogical characterization of inorganic constituents of Canadian coals, 1977-86.

676. CERNY, P., FRYER, B.J., POVONDRA, P., HAWTHORNE, F.C., SMITH, J.V., GOAD, B.E., Univ. Manitoba (Earth Sciences):
Mineralogy and petrology of granitic pegmatites, Manitoba, 1971-.

See:
Granitic pegmatites in service and industry, Mineral. Assoc. Can. Short Course Handbook 8, 1982.

Continuing investigation of the Tanco pegmatite deals recently with the compositional variations of the Ta-oxide minerals and associated phases. Examination of multi-generation sequence of triphylite-lithiophilite and apatite has been initiated. A study of optical properties in the triphylite-lithiophilite series is in progress. Distribution and geochemistry of Nb, Ta-oxide minerals in the Greer Lake pegmatitic granite, and the geochemistry of feldspar crystallization in the Vezna pegmatite, Czechoslovakia are ready for publication.

677. CHAGNON, A., INRS-Géoressources:
L'évolution des minéraux d'argile lors de la diagenèse d'enfouissement, 1982-85.

L'étude de la minéralogie des assemblages argileux a été entreprise à partir de déblais de forage provenant de l'île d'Anticosti, des Basses-Terres du Saint-Laurent et du Golfe du Saint-Laurent. Certaines séquences montrent une évolution avec l'enfouissement alors que d'autres reflètent surtout de détritisme.

678. CHAGNON, A., GOSSELIN, C., INRS-Géoressources, Québec Ministère Énergie et Ressources:
Géologie des argiles des Groupes de Matapédia et d'Honorat de la région de Carleton, Québec, 1982-83.

Déterminer l'évolution diagénétique des sédiments des Groupes de Matapédia et d'Honorat, situer le degré maximum d'évolution par rapport aux phases techniques majeures et délimiter les zones qui ont subi des altérations de types hydrothermals.

679. CHAGNON, A., SASSANO, G.P., INRS-Géoressources, Univ. Concordia:
Géologie des argiles de la région d'Acton Vale, Québec, 1982-83.

Mesurer le degré d'évolution diagénétique des sédiments ordoviciens de la région d'Acton Vale et évaluer l'effet, dans les roches encaissantes, d'intrusions reliées à des minéralisations. Vérifier s'il existe des relations entre les types de minéraux d'argile associés ou leur état cristallochimique et les dites minéralisations.

680. CHEN, T.T., EMR (CANMET):
Mineralogy of mercury in Canadian sulphide ores, 1979-86.

See:
A comparison of galkaite from Nevada and from the type locality, Khaydarkan, Kirgizia, USSR; Can. Mineral., vol. 20, no. 4, p. 575-578, 1982.

Study of the occurrence, distribution and mineralogy of mercury in Canadian sulphide ores and metal extraction plants to provide the basis for the control of noxious emissions.

681. CHEN, T.T., EMR (CANMET):
Low-grade coal in utility boilers, 1982-85.

By studying the phase characteristics and texture of slags the mechanism of fouling and slagging of utility boilers in being appraised. This is an essential component in the utilization of low-grade coal.

682. ERCIT, T.S., CERNY, P., HAWTHORNE, F.C., Univ. Manitoba (Earth Sciences):
Crystal chemistry and geochemistry of simpsonite and associated minerals, 1981-84; Ph.D. thesis (Ercit).

Crystal chemistry and paragenetic relationships of simpsonite, cesstibtantite, alumotantite, natrotantite, "barium microlite", wodginite and other associated minerals, including revision of crystal structures. Definition of genetic conditions for these minerals in metasomatic events of highly fractionated granitic pegmatites.

683. FERGUSON, R.B., Univ Manitoba (Earth Sciences):
The K-feldspar structural end-members ideal sanidine, ideal orthoclase and ideal maximum-microcline, 1981-83.

Sees:
Geol. Assoc. Can. – Mineral. Assoc. Can., Program with abstracts, vol. 7, p. 49, 1982.

684. GIOVENAZZO, D., PERRAULT, G., École Polytechnique (Génie minéral):
Minéralogie de l'or en Abitibi, Québec, 1980-83; thèse de M.Sc.A. (Giovenazzo).

Recherche de la nature de l'or dans les gîtes aurifères de l'Abitibi. Ce projet est avancé et devrait bientôt donner lieu à une publication. L'or natif des gîtes de l'Abitibi contient tantôt 93% Au et 5% Ag, tantôt 80% Au et 20% Ag. Les tellurures minéraux sont occasionnels.

685. JAMBOR, J.L., EMR (CANMET):
Mineralogical studies of the Zn-Pb-Cu ores of the Bathurst area, New Brunswick, 1977-85.

Sees:
Mineralogy of New Brunswick massive sulphide deposits; CANMET Report MRP/MSL 82-68(OP), 1982.

McMaster, an allogenic massive sulphide deposits; CANMET Report 82-93(R), 1982.

Mineralogical studies of several massive sulphide deposits are being carried out to provide data for evaluation of possible extraction and processing schemes.

686. JAMBOR, J.L., EMR (CANMET):
Mineralogy of intermediate members of the plumbojarosite-beaverite series, 1981-82.

Sees:
Beaverite-plumbojarosite solid solutions; Can. Mineral., vol. 21, no. 1, p. 101-114, 1983.

Mineralogy of the jarosite group is important in some aspects of extractive metallurgy where the "jarosite process" is used to precipitate iron from sulphate and chloride solutions. The nature and conditions governing substitution of certain elements in the series are critical to understanding and controlling the process.

687. JAMBOR, J.L., EMR (CANMET):
Mineralogy and alteration of the Lucky Strike deposit, Buchans, Newfoundland, 1982-84.

To define the nature and distribution of the hydrothermal alteration associated with the orebodies at Buchans in order to utilize alteration zoning as a guide to further exploration.

688. McCANN, J., PERRAULT, G., École Polytechnique (Génie minéral):
Géochimie et minéralogie de la minéralisation U-Nb-Terres Rares du Lac Walker, Québec, 1978-83; thèse de M.Sc.A. (McCann).

Sees:
Fergusonite and chevkinite in granite pegmatites, Walter Lake, Quebec; Geol. Assoc. Can. – Mineral. Assoc. Can., Program with abstracts, vol. 7, p. 65, 1982.

Au-delà de la chevkinite et de la fergusonite, nous avons identifié de la gadolinite, du pyrochlore, de l'allanite et plusieurs autres espèces rares. Ces minéralisations appartiennent à la phase mobilisante de l'ensemble magmatique.

689. MCGREGOR, C.R., FERGUSON, R.B., Univ. Manitoba (Earth Sciences):
Characterization of granitic and pegmatitic K-feldspars from Lac du Bonnet, Manitoba and Dryden, northwestern Ontario by chemical and rapid X-ray diffraction methods, 1980-83; M.Sc. thesis (McGregor).

Sees:
Rapid X-ray powder and single-crystal characterization of granite/pegmatitic K-feldspars from Lac du Bonnet, Manitoba and Dryden, Ontario; Geol. Assoc. Can. – Mineral. Assoc. Can., Program with abstracts, vol. 7, p. 66, 1982.

690. MAINWARING, P.R., EMR (CANMET):
Mineralogical study of base metal deposits in the northern Cordillera, 1982-85.

A study of a large Cu-Co deposit has been undertaken to provide data for evaluation of possible mineral processing and extractive metallurgy schemes.

691. MANDARINO, J.A., Royal Ontario Mus. (Mineralogy and Geology):
Descriptive mineralogy, 1960-.

Various rare minerals will be described from new localities.

692. MANDARINO, J.A., Royal Ontario Mus. (Mineralogy and Geology), Univ. Toronto (Geology):
The minerals of Mont St. Hilaire, Québec, 1976-84.

693. MANDARINO, J.A., Royal Ontario Museum (Mineralogy and Geology), Univ. Toronto (Geology):

Assessment of the compatibility of mineralogical data, 1981-85.

The compatibility of the data for the selenites, selenates, tellurites and tellurates was reported at the International Mineralogical Association meeting in Varna, Bulgaria in September, 1982. Results for the iodates, nitrates and oxalates were presented at the GAC-MAC meeting in Winnipeg in May, 1982. Data for several other chemical classes have been gathered. Where the compatibility of a species is found to be poor, the species will be restudied to account for the discrepancies.

694. MANDARINO, J.A., FALLS, R., Royal Ontario Museum (Mineralogy and Geology):
Mineralogical data base, 1983-.

The eventual goal is the establishment of a mineralogical data base which would contain all known data for all species.

695. MOSSMAN, D.J., DOGGETT, M.D., Mount Allison Univ. (Geology):
The case for small scale mining of Nova Scotian gold. Some case histories and geological details, 1982-84; B.Sc. thesis (Doggett).

To thoroughly investigate the case for small scale mining of gold in Nova Scotia and to investigate certain aspects – geological, structural, mineralogical and petrological – within selected gold districts.

696. MOSSMAN, D.J., HARRON, G.A., Mount Allison Univ. (Geology), Dupont Exploration, Vancouver:
The case for paleoplacer gold of Witwatersrand-type in the Huronian Supergroup, Canada, 1981-84.

Sees:
Origin and distribution of gold in Huronian Supergroup, Canada – the case for Witwatersrand-type paleoplacers; J. Precambrian Geol., vol. 20, 1983.

Review of the state of the art with respect to: (1) the known distribution of paleoplacer gold in the Huronian; and (2) aspects of the geochemistry of Huronian paleoplacer gold – the organic connection.

697. MOSSMAN, D.J., PRINGLE, G., Mount Allison Univ. (Geology), EMR (CANMET):
Mineralogy and chemistry of davidite – Canadian occurrences, 1978-83.

To determine the chemistry and mineralogy of Canadian occurrences of the uranium-titanium oxide mineral davidite.

698. OLSON, K., CERNY, P., Univ. Manitoba (Earth Sciences):
Reconnaissance evaluation of the Lower Tanco pegmatite deposit, Manitoba, 1981-84; M.Sc. thesis (Olson).

Mineralogy geochemistry and evaluation of economic potential of the Lower Tanco pegmatite, subjacent to the explited Tanco deposit in southeastern Manitoba. The study is aimed at mineralogical and geochemical characteristics of the main and best Ta-mineralized part of the pegmatite, based on sampling restricted underground workings and drill cores.

699. OTTAWAY, T., WICKS, F.J., Univ. Toronto (Geology), Royal Ontario Mus. (Mineralogy and Geology):
Mineralogy and geochemistry of Colombian emerald deposits, 1981-85; M.Sc. thesis (Ottaway).

Studies have focused on the fluid inclusions in the emeralds and associated accessory minerals such as parisite.

700. PERRAULT, G., BEAUDOIN, A., École Polytechnique (Génie minéral):
Morphologie de la sérandite du Mont St-Hilaire, Québec, 1983.

L'objectif est d'inventorier toutes les formes cristallines pour la sérandite du Mont St-Hilaire, Québec.

701. PETERSON, R.C., Queen's Univ. (Geological Sciences):
Charge density study of silicate mineral systems, 1981-.

X-ray crystallographic work concerning detailed features of bonding features in silicate minerals.

702. PETRUK, W., EMR (CANMET):
Mineralogy applied to processing of Zn-Pb-Cu ores from northwestern New Brunswick, 1975-86.

The application of image analysis to mineral processing problems is being further refined with a view to using scanning electron microscope images for rapid, automated analysis.

703. PLANT, A.G., Geol. Surv. Can.:
Electron beam microanalysis, 1962-.

704. REED, S.J.B., SMITH, D.G.W., Cambridge Univ. (U.K.) (Earth Sciences), Univ. Alberta (Geology):
REE in phosphate phases of chondritic meteorites, 1980-84.

Attempts are being made to determine both the absolute and the relative abundances of REE in the phosphate phases of a wide range of chrondritic meteorites. These phases have been identified and mapped in thin section using cathodoluminescence techniques, and fully quantitative electron microprobe analyses of major and minor elements obtained. Concentrations of REE, which are at the trace (ppm) level, are being determined by means of the ion microprobe at the Department of Earth Sciences (Bullard Labs.), Cambridge. Initial results indicate that there are substantial differences in the REE concentrations in the apatite and

merrillite (=whitlockite), with the latter phase showing significantly higher concentrations. Ultimately it is hoped to be able to obtain important information on the thermal histories of these chondrites from the distribution of REE and their homogeneity. It may also prove possible to estimate the proportion of the total REE of chrondites that are present in the phosphate phases.

705. RIMSAITE, J.Y.H., Geol. Surv. Can.:
Mineralogy of uranium deposits in granitic rocks in the Grenville structural province, Ontario and Quebec, 1977-.

See
The leaching of radionuclides and other ions during alteration and replacement of accessory minerals in radioactive rocks; Geol. Surv. Can., Paper 82-1B, p. 253-266, 1982.

706. RIVE, M., BOIVIN, L., Québec Ministère Énergie et Ressources:
Reconnaissances des différents massifs de granitoides Abitibi-Témiscamingue, Québec, 1980-86.

Il s'agit de différencier les granitoides selon leur composition pétrologiques et éventuellement de déterminer les facies favorables à divers types de minéralisations.

707. SMITH, D.G.W., Univ. Alberta (Geology):
The classification and mineral chemistry of the Skiff meteorite, 1980-84.

The Skiff meteorite was found in southern Alberta, probably during 1966, and came into the possession of the University of Alberta in 1978. Preliminary work on the olivine compositional combined with textural observations, suggest that it belongs to the H group of chondrites and petrologic type 4. Investigation of the mineral chemistry and the characterisation of this meteorite should be completed during the coming year.

708. SMITH, D.G.W., GOLD, C.M., Univ. Alberta (Geology):
Investigations of clay mineral mixtures by electron microprobe analysis and computer based statistical techniques, 1977-.

Statistical techniques have been developed which permit the determination of the most probable proportions of clay minerals in mixtures on the basis of bulk analyses. Although such analyses could be made by any appropriate method, in this work they have been obtained by specially developed electron microprobe techniques which allow quantitative data to be obtained rapidly, using very small amounts of samples. Estimates of the proportions of different clay minerals in a mixture are made on the basis of a statistical comparison of the sample composition with a data base containing several hundred superior analyses of clay minerals culled from the literature. The method is applicable to both interstatified clays and mechanical mixtures. Attempts will be made to develop the techniques further to permit an estimate to be made of the most likely compositions of the clays present in the mixtures.

709. SMITH, D.G.W., LEIBOVITZ, D., Univ. Alberta (Geology):
A computer-based chemical index of minerals, 1981-84.

The widespread availability of the electron microprobe, the refinement in techniques of energy dispersive analysis and the development of sophisticated data processing software, have made the acquisition of reliable mineral analyses relatively straightforward and rapid. However, the identification of a mineral phase from an analysis may not always be a simple matter, and when the phase in question is rare or complex, it may require the expenditure of considerable amounts of time on literature searches, compositional calculations and possible additional optical and/or X-ray diffraction work.

A FORTRAN IV computer program has been developed which is capable of providing the most probable identity (or identities) of an unknown on the basis of a chemical analysis (with or without additional data on other properties such as cell dimensions, optical parameters, indentation hardness, etc.). The basic information on composition and other properties of all well-defined mineral species and sub-species is presently being entered to establish the essential data base. Each entry is cross-referenced to the appropriate JCPDS listing.

The program will be most useful when dealing with complex mineral groups such as the sulphosalts, the uranium minerals, phosphates, etc. However, the program should also permit microanalysts who do not have a strong background in mineralogy to make reliable identifications of any mineral phases in specimens they are investigating.

710. SZYMANSKI, J.T., EMR (CANMET):
Crystal structure analysis of minerals to aid mineral processing and extractive metallurgy research, 1982-86.

See
A crystal structure refinement of synthetic brannerite and its bearing on rate of alkaline-carbonate leaching of brannerite in ore; Can. Mineral., vol. 20, pt. 2, p. 271-280, 1982.

A comperison of gaikaite from Nevada and the type locality, Khaydarkan Kirgizia, USSR; Can. Mineral., vol. 20, pt. 4, p. 575-578, 1982.

711. VON BITTER, P.H., GAIT, R., Royal Ontario Mus. (Invert. Palaeontology, Mineralogy and Geology):
Calcite pseudomorphs from the Pleistocene of western Newfoundland – possible palaeo-environmental indicators, 1976-83.

712. WICKS, F.J., Royal Ontario Mus. (Mineralogy and Geology):
The structures and crystal chemistry of the serpentine minerals, 1970-.

Recent efforts have been directed to the study of picrolites and the preparation of representative X-ray powder diffraction standards.

713. WICKS, F.J., PLANT, A.G., Royal Ontario Mus. (Mineralogy and Geology), Geol. Surv. Can.:
Electron microprobe studies of serpentine minerals, 1978-83.

See
The accuracy and precision of routine energy-dispersive electron microprobe analysis of serpentine; X-ray Spectrometry, vol. 12, no. 2, p. 51-57, 1983.

714. ZODROW, E.L., Univ. College of Cape Breton (Geology):
Hydrated sulfates of Sydney Coalfield, Nova Scotia, 1974-.

Over 30 secondary, hydrated sulfates have been identified from Sydney Coalfield with the copiapite minerals leading the list. For two alumino-copiapite and seven magnesian, magnesian-alumino-ferroan copiapite samples X-ray powder crystallographic data, unit cell volume and content, together with S^{34}/S^{32} isotopic ratios are available. The copiapites appear to be sensitive indicators of local geochemical conditions (i.e., ease of substitution in the X position of the lattice) and their variation in chemistry confirms the great variability of cationic contents in coal (as observed already by J.E. Hawley for certain trace elements).

PALEONTOLOGY/PALÉONTOLOGIE

INVERTEBRATE/INVERTÉBRÉS

715. BAMBER, E.W., Geol. Surv. Can.:
Carboniferous and Permian biostratigraphy and coral faunas, western and northern Canada, 1971-.

716. BARNES, C.R., CARSON, D.M., Memorial Univ. (Earth Sciences):
Ordovician conodont biostratigraphy of southern Devon Island, Arctic Canada, 1976-85.

717. BARNES, C.R., DUFFIELD, S.L., FAHRAEUS, L.E., UYENO, T.T., Memorial Univ. (Earth Sciences):
Conodont biostratigraphy and paleoecology of Ordovician and Silurian strata of Anticosti Island, Québec, 1975-90.

718. BARNES, C.R., FAHRAEUS, L.E., BAGNOLI, G., STEVENS, R.K., Memorial Univ. (Earth Sciences):
Conodont biostratigraphy and paleoecology of Cambro-Ordovician Cow Head Group of western Newfoundland, 1982-.

719. BARNES, C.R., WEBBY, B.D., COOPER, B.J., DRUCE, E.D., Memorial Univ. (Earth Sciences):
Ordovician conodont biostratigraphy of carbonate units in Amadeus Basin, Georgina Basin and Tasman Geosyncline, Australia, 1976-90.

720. BOLTON, T.E., Geol. Surv. Can.:
Ordovician-Silurian biostratigraphy, Southampton Island, District of Keewatin, 1970-.

721. CALDWELL, W.G.E., NORTH, B.R., Univ. Saskatchewan (Geological Sciences):
Biostratigraphic studies in the Cretaceous System of the Western Interior Basin, 1959-.

Work continues in testing the applicability of the foraminiferal zonal scheme, established by Caldwell and others (1978) in the Western Interior of Canada, to fossiliferous sections in more southerly parts of the Western Interior basin and to using faunal zones to detect the presence of disconformities.

722. CAMERON, B.E.B., Geol. Surv. Can.:
Foraminiferal biostratigraphy of the Pacific margin, 1969-.

723. CAMERON, B.W., Acadia Univ. (Geology):
Evolution, paleoecology and depth distribution of fossil marine microbial endoliths, 1979-85.

To determine the evolution, paleoecology and depth distribution of fossil marine microbial endoliths, which are primarily carbonate-boring algae and fungi that have existed at least since the Cambrian. Recent work indicates that microbial endoliths are known from all depths of the ocean and have members from all the five kingdoms. They, therefore, represent major gaps in our understanding of the evolution of life because many groups have no other fossil record. Microbial endoliths are significant also in micrite envelope formation, grain diminution, biokarst formation, carbonate coastal erosion, and the global recycling of organic matter and atmospheric oxygen. The small size of microbial endoliths was an obstacle

until recently developed resin-embedding techniques permitted accurate study of borehole casts by scanning electron microscopy. Now they can be identified from small samples, shell fragments, well cores, oolites, etc. Because endoliths have diversified ecologically, appear evolutionarily conservative and exhibit distinctive borehole morphologies, refinement of paleo-depth criteria over a wide depth range throughout Phanerozoic time is now possible. The principal objectives are: 1) to complete a survey of their abundance and diversity in geologic periods not already studied in order to complete a general picture of their temporal distribution; 2) to study the systematics and paleoecology of specific endoliths and their associations that have persisted through time, correlating them with their respective paleoenvironments; and 3) to compare fossil and recent forms in order to refine criteria for identification and to provide a sound data base for eventually establishing a paleodepth zonation using microbial endoliths as indices.

724. CARRASCO, R., WESTERMANN, G.E.G., McMaster Univ. (Geology):
The Bathonian-Callovian ammonoid faunas of Oaxaca and Guerrero, Mexico, 1982-86; Ph.D. thesis (Carrasco).

725. CHATTERTON, B.D.E., OVER, J., LANTOS, J., JOHNSON, D., Univ. Alberta (Geology):
Trilobite and conodont faunas from Paleozoic rocks in Canada, 1970-; M.Sc. theses (Over, Lantos).

See:
Ordovician Pterygometopidae (Trilobita) of North America; Can. J. Earth Sci., vol. 19, p. 2179-2206, 1982.

Two monographs have been completed on Silurian trilobite faunas from the Mackenzie Mountains. Additional monographic works on the Silurian trilobite faunas of this region are in progress. Work is in progress on the Siluro/Ordovician boundary trilobite faunas of Anticosti Island (with R. Ludvigsen and P.J. Lespérance); and on the Lower Silurian trilobite faunas of Anticosti Island (with R. Ludvigsen). Work is progressing on several different conodont projects, including: Silurian conodonts from the Mackenzie Mountains (Over); Famennian conodonts from western Alberta (Johnson); Middle Devonian conodonts from the Pine Point area (Lantos).

726. COLLINS, D.H., BRIGGS, D.E.G., BEALES, F.W., Royal Ontario Mus. (Invert. Palaeontology):
Distribution, composition and environmental setting of Burgess shale faunas along the Cathedral Escarpment, British Columbia, 1981-86.

Seven new soft-bodied fossil localities, including one new fauna, were discovered along the Cathedral Escarpment in 1982. This is additional to a like number found in 1981. The new fauna, characterized by **Tuzoia** and other arthropods, was found in talus above Raymond's quarry on Fossil Ridge. **Marrella** and **Burgessia** were found on Mount Field, suggesting that the Phyllopod bed extends through the mountain. Reconnaissance sampling of the **Alalcomenaeus-Branchiocaris** fauna discovered last year yielded a ctenophore-like form and other rare genera. The Ogygopsis shale on Mount Stephen is located stratigraphically on top of dolomitized "boundary limestone" near the base of the Stephen Formation.

Five distinct faunas at 4 stratigraphic levels have now been recognized in the Stephen Formation, and there are probably more to come. It is becoming evident that the Burgess shale faunas together comprise a marine, open-shelf, fore-reef complex.

727. COLLINS, D.H., CHEN, J-Y., Royal Ontario Mus. (Invert. Palaeontology):
Nautiloids of the Lower Ordovician **Diphragmoceras** Beds (St. George Group), western Newfoundland, 1982-84.

To determine the systematics of the nautiloids of the Lower Ordovician **Diphragmoceras** beds at the base of the St. George Group in western Newfoundland; to determine the significance of the nautiloids for the evolution of the group and their use in the biostratigraphy of North America and elsewhere.

728. COPELAND, M.J., Geol. Surv. Can.:
Paleozoic ostracodes of Canada, 1972-.

See:
An occurrence of the Silurian ostracode **Beyrichia** (Beyrichia) from Anticosti Island, Quebec; Geol. Surv. Can., Paper 82-1B, p. 223, 224, 1982.

Bathymetry of early Middle Ordovician (Chazy) ostracodes, Lower Esbataottine Formation, District of Mackenzie; Geol. Surv. Can., Bull. 347, 1982.

729. ELIAS, R.J., Univ. Manitoba (Earth Sciences):
Late Ordovician solitary rugose corals of North America, 1979-.

See:
Latest Ordovician solitary rugose corals of Eastern North America; Bull. Amer. Paleontol., vol. 81, no. 314, 1982.

Paleoecology and biostratinomy of solitary rugose corals in the Stony Mountain Formation (Upper Ordovician), Stony Mountain, Manitoba; Can. J. Earth Sci., vol. 19, no. 8, p. 1582-1598, 1982.

Study completed: Late Ordovician solitary rugose corals of the eastern Klainath Mountains, northern California (with A.W. Potter, Oregon State University). Major studies in progress: 1) Late Ordovician solitary rugose corals of the Montoya Group, southern New Mexico and westernmost Texas; and 2) latest Ordovician and earliest Silurian solitary rugose corals of the east-central United States.

730. FAY, I., CALDWELL, W.G.E., Univ. Saskatchewan (Geological Sciences):
Early Llandoverian patch reefs of Manitoulin Island, Ontario, 1979-83; Ph.D. thesis (Fay).

Project essentially completed. Data yet to be published.

731. FERGUSON, L., Mount Allison Univ. (Geology):
A biometrical study of the scottish Lower Carboniferous ostracod genera **Bairdia** and **Paraparchites**, 1969-85.

Currently resuming study of topotype material of **Bairdia curta** McCoy (the genotype) and studying well preserved assemblages from Craigenglen near Glasgow.

732. GRADSTEIN, F.M., Geol. Surv. Can.:
Biostratigraphic history of the Mesozoic – Cenozoic sediments of the Grand Banks, Northeast Newfoundland and Labrador Shelves (based on Foraminifera and Ostracoda), 1974-.

See:
Tertiary subsurface correlations using pyritized diatoms, offshore Eastern Canada; Geol. Surv. Can., Paper 81-1B, p. 17-23, 1981.

733. GRADSTEIN, F.M., Geol. Surv. Can.:
Taxonomy, biostratigraphy, paleoecology and paleobiogeography of Mesozoic – Cenozoic agglutinated Foraminifera, 1979-.

734. HALL, R.L., Univ. Calgary (Geology and Geophysics):
Lithostratigraphy and biostratigraphy of the Jurassic Fernie Formation, 1978-84.

The presence of at least four ammonite faunas ranging through most of the Bathonian Stage, previously thought to be entirely absent from the Fernie Formation, has been established. These are the (lowest) **Cranocephalites costidensus, Pararaeineckeia-Cobbanites, Iniskinites** and **Kepplerites** cf. **tychonis** (highest) horizons. Precise correlation within the Fernie is hampered by lack of stratigraphically continuous sections, and with other areas by the occurrence of reptominantly endemic genera.

Work is now proceeding on analysis of more complete ammonite collections from Sinemurian and Toarcian strata in the Fernie.

735. HEWITT, R.A., WESTERMANN, G.E.G., McMaster Univ. (Geology):
Functional morphology of ectocochliate phragmocones, 1981-83.

Tests on Recent Nautilus shells under hydrostatic pressure of 0.68 MN/m^2 were used to determine the relative tensile and compressive strains associated with the septa and septal sutures. These strains were measured by small electrical resistance variations within strain guages, and imply that the septa support the outer shell wall but could cause failure by bending stresses at the septal sutures. This possibility was examined by making measurements of the sutural complexity and whorl shape variation of fossil ammonites that were likely to be adapted to avoid failure at moderate hydrostatic pressures. The strength and composition of the phragmocones of fossil nautiloids and ammonoids also enabled us to discuss the depths of ancient sediments environments; but it has been necessary to describe the varied composition and function of their connecting rings to evaluate the likely errors in these deductions.

736. HOOPER, K., Carleton Univ. (Geology):
Neogene microfauna from D.S.D.P. southwestern Pacific Ocean, 1980-83.

737. KOBLUK, D.R., Univ. Toronto (Geology):
Cavity-dwelling organisms in Paleozoic reefs, 1977-.

See:
First record of **Labyrinthus seraufi** Kobluk 1979 from the southern Appalachians: Upper Sandy Dolomite, Virginia; Can. J. Earth Sci., vol. 19, p. 1094-1098, 1982.

An investigation of the community structure of coelobiontic (cavity-dwelling) invertebrates in reefs and mounds of early and middle Paleozoic age. To date, coelobionts have been found in all the reefs and mounds of Cambrian to Ordovician age that have been studied. In early Paleozoic reef cavities, coelobiontic assemblages are moderately diverse. Most of the biotas are micro organisms, but bryozoans, corals, archaeocyathids and ichnofossils also occur.

738. KUKALOVA-PECK, J., Carleton Univ. (Geology):
Morphology and evolution of Paleozoic insects with reference to phylogeny of Recent insects, 1975-.

See:
Insect beaks and coevolution in Carboniferous communities; Proc. IX Internat. Cong. Carboniferous Stratig. Geol., 1983.

Paleozoic insects hold data for many, largely unsolved fundamental problems of evolution of modern insects. The first synthesis on insect ontogeny and metamorphosis, based upon data found in the Paleozoic juveniles, was published in 1978. Fossil evidence suggested new interpretation of both events, very different from that deduced from modern morphology; the paper attracted over 600 reprint requests, and inspired neurophysiological research of insect abdomen, which recently confirmed that insect wings, indeed, used to occur also on the abdomen in a series, as the fossil record indicated.

The next synthetic paper now ready for press presents new ideas on the identity of wing precursor, new wing articulation theory, and new concept of the basic arthropodan leg. The data are derived from the fossil evidence and are then interpreted and documented with the help of modern embryological and ontogenetic investigations, tieing all the evidence together. The paper shows distribution of leg-derived features in the thorax and abdomen, while the head had been dealt with in a special paper (1983), which also is concerned with paleoecology and the strong possibility of insect-induced Paleozoic pollination.

739. LARSSON, S., STEARN, C.W., McGill Univ. (Geological Sciences):
Silurian stratigraphy and paleontology of the Québec Embayment of the Hudson Bay Lowland, 1982-84; M.Sc. thesis (Larsson).

740. LUDVIGSEN, R., CHATTERTON, B.D.E., Univ. Toronto (Geology), Univ. Alberta (Geology):
Ordovician trilobites of the Mackenzie Mountains, Northwest Territories-Yukon Territory, 1979-85.

For the past 10 years we have been studying the systematics of Middle Ordovician silicified trilobites from platform and platform-margin carbonates of the western District of Mackenzie (that is, the Sunblood, Esbatoattine, and Whittaker formations). A number of papers and monographs have already been published. We are now continuing this study with investigation of the Arenig-Ashgill trilobites of the shales and black limestones of the Road River Formation and with further treatment of the rich trilobite faunas of the Upper Ordovician Whittaker Formation.

741. LUDVIGSEN, R., CHATTERTON, B.D.E., LESPÉRANCE, P.J., Univ. Toronto (Geology), Univ. Montréal (Géologie):
Silurian trilobites of Anticosti Island, Quebec, 1982-86.

The Lower Silurian faunal succession exposed on Anticosti Island is arguably the best in the world. The name Anticosti Series has been proposed as the lower series standard for the Silurian System. We are investigating the rich trilobite faunas of the Becscie, Gun River, Jupiter, and Chicotte formations with the aim of producing a trilobite biostratigraphy for the Anticosti Series in its type area. Field work in 1982 concentrated on detailed collecting across the Ordovician-Silurian boundary and on the Bescie and Jupiter formations.

742. LUDVIGSEN, R., KINDLE, C.H., Univ. Toronto (Geology):
Upper Cambrian trilobites of the Cow Head Group, western Newfoundland, 1980-86.

The fossil record of Cambrian bank-edge carbonates in eastern North America is now preserved in carbonate clast olistotromes of the Cow Head Group of western Newfoundland. Many of the carbonate clasts contain well-preserved triolobite faunas which have been actively collected over many years. These collections are now at the Geological Survey of Canada, Ottawa. Franconian and Trempealeauan trilobite assemblages from 175 boulders are now being studied with the aim of establishing a trilobite biostratigraphy for the Upper Cambrian bank-margin. Some 1300 trilobites have been photographed to date. In addition, it proved necessary to restudy and photograph most of the Upper Cambrian trilobite types from the Gorge Formation of Vermont and from the Levis Formation in Quebec.

743. LUDVIGSEN, R., TRIPP, R.P., Univ. Toronto (Geology):
Silurian trilobites of northern Yukon Territory, 1981-84.

Silurian trilobites of the northern Yukon Territory are found in two contrasting facies, 1) light grey to white massive carbonates deposited on platforms, and 2) dark grey to black lime mudstones deposited in surrounding troughs. We are studying the trilobites of the late Anticosti Series from white limestones exposed in the Illtyd Range and from black lime mudstones exposed in Prongs Creek. The Illtyd Range assemblage is diverse and dominated by **Stenopareia**; the Pronga Creek assemblage is less diverse and dominated by **Kosovopeltis** and **Otarion (Songkania)**. We also plan to investigate Ludlow Series trilobites from higher in the section at Pronga Creek.

744. LUDVIGSEN, R., WESTROP, S.R., Univ. Toronto (Geology):
Franconian trilobites of New York State, 1982-83.

The Galway Formation of east-central New York State contains trilobite assemblages dominated by **Dellea** and **Elvinia. Drabia, Camarapsis,** and **Calocephalites** also occur. These assemblages correlate with the **Elvinia** Zone of early Franconian age. The overlying Hoyt Limestone contains two trilobite assemblages – one occurs in algal buildups and is dominated by **Plethopeltis,** the other occurs in level-bottom lime sands and is dominated by **Prosaukia.** The presence of **Saratogia (Saratogia) calcifera** and **Prosaukia hartti** in the Hoyt suggest correlation with the **Prosaukia** Subzone of the upper Mississippi Valley. The formation is dated as late Franconian (and possibly earliest Trempealeauan). It is entirely older than the fossiliferous parts of the Whitehall Formation in nearby Washington County.

745. LUDVIGSEN, R., WESTROP, S.R., Univ. Toronto (Geology):
Cambrian and Ordovician trilobite biofacies of North America, 1982-84.

See:
The life habits of the Ordovician illaenine trilobite **Bumastoides;** Lethaia, vol. 16, p. 13-26, 1983.

Accurate biostratigraphy requires knowledge of both spatial and temporal distributions of faunal groups. We are investigating Cambrian and Ordovician trilobite biofacies and their control at a number of localities in North America with the aim of providing constraints on the use of trilobite distributional data in correlation. Three projects have been completed: 1) Middle Ordovician of the southern Mackenzie Mountains; 2) Upper Ordovician of southern Manitoba; and 3) Cambrian-Ordovician boundary interval of North America.

746. McGUGAN, A., LAND, H., Univ. Calgary (Geology and Geophysics):
1) Cretaceous foraminiferal biostratigraphy, southern Alberta – northern Montana. 2) Recent Foraminifera, west coast, 1983-. 3) Permian conodonts, 1982. 4) Cretaceous Foraminifera. 5) Permian-Carboniferous biostratigraphy, 1983.

See:
Palaeacis Haime 1857 from the Mississippian of western Canada; Third North American Paleontol. Conv., Program with abstracts, 1982.

Upper Cretaceous (Campanian and Maestrichtian) Foraminifera from the Upper Lambert and Northumberland Formations, Gulf Islands, B.C.; Micropaleontology, vol. 29, no. 2, 1983.

First record and a new species of **Palaeacis** Haime 1857 from the Mississippian of Western Canada; J. Paleontol., vol. 57, no. 1, p. 42-47, 1983.

747. McNEIL, D.H., Geol. Surv. Can.:
Mesozoic and Cenozoic Foraminifera of the Arctic western mainland of Canada, 1978-.

748. MATTHEWS, J.V., JR., Geol. Surv. Can.:
Late Cenozoic fossil insects and Late Cenozoic paleoecology, 1973-.

See:
Taxa in lake sediments of the District of Keewatin; Geol. Surv. Can., Paper 83-1A, p. 357-361, 1983.

749. MOORE, R.G., Acadia Univ. (Geology):
Windsor Group, biostratigraphy, Parrsboro and Upper Economy areas, Nova Scotia 1981-83.

To unravel the Windsor stratigraphy for the area based upon careful study of sections in scattered fault blocks; to compare this with the type section and interpret the differences which obtain; and to learn more about the paleogeography and tectonic history of the area.

750. NORRIS, A.W., Geol. Surv. Can.:
Brachiopods of the lower Upper Devonian Waterways Formation of northeastern Alberta, 1977-.

751. NOWLAN, G.S., Geol. Surv. Can.:
Paleozoic conodonts of eastern Canada, 1977-.

See:
Conodonts and the position of the Ordovician – Silurian boundary at the eastern end of Anticosti Island, Québec, Canada; Can. J. Earth Sci., vol. 19, no. 6, p. 1332-1335, 1982.

Biostratigraphic, paleogeographic, and tectonic implications of Late Ordovician conodonts from the Grog Brook Group, northwestern New Brunswick; Can. J. Earth Sci., vol. 20, no. 4, p. 651-671, 1983.

752. ORCHARD, M.J., Geol. Surv. Can.:
Conodont biostratigraphy and biogeography in the Canadian Cordillera, 1981-.

753. PEMBERTON, S.G., Alberta Research Council (Geol. Surv.):
Ichnology of the Cardium Formation, Cretaceous, Alberta, 1982-83.

See:
Ichnological nomenclature and the **Palacophycus – Planolites** dilemma; J. Paleontol., vol. 56, p. 843-881, 1982.

Ichnology of the storm-dominated Cardium Formation in south-central Alberta; facies analysis and environmental interpretation, ichnofossils indicate that the unit was deposited in a shallow shelf position below fair-weather wave base but above storm wave base.

754. POPE, C.S., NOBLE, J.P.A., Univ. New Brunswick (Geology):
The taxonomy and paleoecology of the stromatoporoid fauna of the West Point Formation (Silurian), Gaspé Peninsula, Québec, 1980-83; M.Sc. thesis (Pope).

The Upper Silurian West Point Formation outcrops on the southern Gaspé coast in the areas of Port Daniel and Black Cape. The fossiliferous carbonate and siliciclastic units of this formation have been described by many workers since the mid-1800's but the stratigraphy of the area was most recently revised by P.A. Bourque (1980), Laval University. Bourque's stratigraphy, which is based on the sedimentology and, to a lesser extent, the paleontology of these rocks, divides the West Point Formation into nine reef-related facies. Since stromatoporoids are a major part of the fauna in the lower half of the formation and are the major reef-building organism in the upper half, a taxonomic and morphopaleoecologic study of these stromatoporoids has been undertaken. This study of species distributed and morphologic adaptations to the various environments will be used to support or modify Bourque's facies analysis.

755. PRATT, B.R., LUDVIGSEN, R., Univ. Toronto (Geology):
Trilobite biostratigraphy and sedimentology of Middle Cambrian to Lower Ordovician formations, western District of Mackenzie and Yukon Territory, 1983-86; Ph.D. thesis (Pratt).

An integrated study is anticipated of the trilobite paeiontology and sedimentology of the Middle Cambrian – Lower Ordovician sequence, Mackenzie Mountains, N.W.T. and Yukon. This sequence represents a broad Lower Paleozoic carbonate shelf-to-basin transition. Although the core of this project will be taxonomic, the fauna will be studied with biostratigraphic and biofacies approach and related to detailed sedimentological observations to formulate a complete paleo-environmental picture.

756. SCHENK, P.E., SCOTT, D.B., MEDIOLI, F.S., AKSU, A., MUDIE, P.J., VILKS, G., Dalhousie Univ. (Geology), Geol. Surv. Can. (A.G.C.):
Quaternary paleoceanography of eastern Canada, 1980-83.

757. SCOTT, D.B., Dalhousie Univ. (Geology):
Sea-level and Pleistocene history of Sable Island, Nova Scotia, 1979-83.

758. SCOTT, D.B., GREENBERG, O.A., Dalhousie Univ. (Geology), Bedford Instit. Oceanography:
Sea level and tidal devleopment in the Bay of Fundy, Nova Scotia, 1981-83.

759. SIDDIQUI, K., WESTERMANN, G.E.G., KRISHANA, J., McMaster Univ. (Geology):
Revision of Callovian-Oxfordian ammonite biostratigraphy of Kachchh (West India) and of Spiti Shales, Himalayas (N. India), 1982-86; Ph.D. thesis (Siddiqui).

760. STEARN, C.W., McGill Univ. (Geological Sciences):
Stromatoporoids of the Stuart Bay and Blue Fiord formations, Arctic Canada, 1978-84.

See:
Stromatoporoids from the Blue Fiord Formation (Lower Devonian) Ellesmere Island, Arctic Canada; J. Paleontol, vol. 57, no. 3, p. 539-559, 1983.

761. TOZER, E.T., Geol. Surv. Can.:
Canadian Triassic Ammonoidea and Bivalvia, 1967-.

762. TUFFNELL, P.A., LUDVIGSEN, R., Univ. Toronto (Geology):
Triarthrus biostratigraphy of the Upper Ordovician Whitby Formation, southern Ontario, 1982-83; M.Sc. thesis (Tuffnell).

The Whitby Formation in southern Ontario varies in thickness from 20 m to 80 m. Significant exposures are found in the Rouge River, Oshawa, Ottawa, Collingwood and Manitoulin areas. The bulk of the information on the formation comes from the 20 cores drilled recently by the Ontario Geological Survey. Correlation within the formation is virtually impossible by any means other than biostratigraphy. The trilobite **Triarthrus** occurs throughout the lower, middle and upper members of the Whitby Formation. There are four species of **Triarthrus**: **T. eatoni** (Hall), **T. canadensis** Smith, **T. spinosus** Billings and **T. rougensis** Parks. The ranges of these species can be used to correlate within the Whitby Formation.

763. UYENO, T.T., Geol. Surv. Can.:
Conodont biostratigraphy of Siluro-Devonian rocks of the Arctic Islands, 1968-.

764. VON BITTER, P.H., Royal Ontario Mus. (Invert. Paleontology), Univ. Toronto (Geology):
Conodont biostratigraphy and palaeoecology, Pennsylvanian and Permian, Arctic Islands, Canada, 1982-.

The interval June 30 to July 27, 1982 was spent at and adjacent to the head of Tanquary Fiord, Ellesmere Island, N.W.T. measuring four stratigraphic sections of Pennsylvanian and Permian strata and sampling them for microfossils, especially conodonts.

Two sections of the Canyon Fiord and the Belcher Channel formations in the MacDonald River valley and at the Omega Lakes were measured and sampled. Two further sections, in Yelverton Pass, were similarly measured and sampled. The first, a section of the Belcher Channel Formation, approximately 23 km n.w. of the head of Tanquary Fiord, was sampled in detail. The second, a 700 m ± section of map unit Cpc (Mayr et al., 1982), approximately 60 km n.w. of the head of Tanquary Fiord, was, for climatic and time reasons, only incompletely measured and sampled. Approximately 100 samples of marine carbonate, each weighing 4-5 kg, were collected and are currently being examined for conodonts.

765. VON BITTER, P.H., AUSTIN, R.L., PLINT-GEBERL, H.A., DHINDRA, R., Royal Ontario Mus. (Invert. Palaeontology) Univ. Toronto (Geology):
Palaeoecology and biostratigraphy of Lower Carboniferous (Windsor and Codroy groups) conodonts, Atlantic Provinces, Canada, 1971-; M.Sc. theses (Plint-Geberl, Dhindsa).

See:
The Dinantian **Taphrognathus** *n.* sp. A conodont range zone of Great Britain and Atlantic Canada; Palaeontology, 1983.

Conodont biostratigraphy of the Middle Viséan Lower Windsor Group, type area, Nova Scotia, Canada; Geol. Assoc. Can. – Mineral. Assoc. Can., Abstract with Program, vol. 8, p. A72, 1983.

Windsor Group (Lower Carboniferous) conodont biostratigraphy, palaeoecology, and taxonomy, the Magdalen Islands, Quebec; ibid., p. A55, 1983.

766. VON BITTER, P.H., MERRILL, G.K., HECKEL, P., MUNRO, I., MILLAR-CAMPBELL, C., Royal Ontario Mus. (Invert. Palaeontology), Univ. Toronto (Geology), Univ. Houston Downtown College (Geology), Univ. Iowa (Geology), Carleton Univ. (Geology):
Conodont distribution in the Pennsylvanian of North America – taxonomic and palaeoecologic implications, 1968-.

See:
Late Palaeozoic species of **Ellisonia** (Conodontophorida): evolutionary and palaeoecological significance; Royal Ontario Mus., Life Sci. Contrib. 136, 1983.

767. VON BITTER, P.H., SANDBERG, C., ORCHARD, M.J., Royal Ontario Mus. (Invert. Palaeontology), US. Geol. Surv., Geol. Surv. Can.:
The phylogeny, ontogeny and palaeoecology of species of **Mesognathus**, 1980-83.

768. WADDINGTON, J.B., LUDVIGSEN, R., Royal Ontario Mus. (Invert. Palaeontology), Univ. Toronto (Geology):
Fossils of Ontario: Brachiopods, 1981-84.

769. WALL, J.H., Geol. Surv. Can.:
Reconnaissance of Mesozoic Foraminifera of Arctic Islands, 1972-.

770. WALL, J.H., Geol. Surv. Can.:
Triassic Foraminifera of the Sverdrup Basin, District of Franklin, 1979-.

771. WESTERMANN, G.E.G., CALLOMON, J., McMaster Univ. (Geology):
Macrocephalitidae and associated ammonoids of East-Indies, 1981-83.

772. WESTERMANN, G.E.G., RICCARDI, A.C., HILLEBRANDT, A., McMaster Univ. (Geology):
Jurassic ammonoid biostratigraphy of South Andes. III & IV: Aalenian and Bathonian-lower Callovian, 1970-85.

773. WESTROP, S.R., LUDVIGSEN, R., Univ. Toronto (Geology):
Systematics and paleoecology of Late Cambrian and basal Ordovician (Franconian – Tremadocian) trilobites, southern Canadian Rocky Mountains, 1980-83; Ph.D. thesis (Westrop).

The systematics and biostratigraphy of the Late Cambrian and basal Ordovician (Franconian-Tremadocian) trilobites from the Bison Creek, Mistaya and Lower Survey Peak formations in Banff and Jasper National parks, Alberta, are under investigation. About 130 species, representing 70 genera have been recovered from six major stratigraphic sections spread over a north-south distance of about 200 kilometers. Twelve informal biostratigraphic units have been recognised (Westrop et al., 1981) and will provide the basis for a trilobite-based zonation of the Late Cambrian rock in southern Alberta. In addition, a series of lithofacies-related trilobite biofacies have been defined from relative abundance data. Analysis of the Cambrian-Ordovician boundary interval has been extended to other parts of North America using both published data and museum collections and indicates that biofacies distribution patterns are far more complex than has been previously appreciated. A trilobite "mass extinction" event near the Cambrian-Ordovician boundary is related to a major biogeographic reorganisation in response to a cratonward biofacies shift.

774. WILSON, J.B., CALDWELL, W.G.E., Univ. Saskatchewan (Geological Sciences):
A mid-Cretaceous unconformity in the Western Interior of Canada, 1983-85; Ph.D. thesis (Wilson).

Previous studies point to the presence of a major unconformity across the Western Interior Cretaceous basin in Canada, which brings Santonian calcareous shales to rest on similar calcareous shales of Late Cenomanian-Early Turonian age or, in places, on non-calcareous shales of Late Albian age. The project centres on the problem of tracing the unconformity across the basin, from the Rocky Mountain foothills to the Manitoba escarpment, assessing the varying magnitude of the hiatus (lacuna) in different geographical areas, and explaining the controlling movements whih caused the unconformity and its variations in magnitude.

775. YOUNG, G.A., LUDVIGSEN, R., Univ. Toronto (Geology):
Systematics of Middle Cambrian trilobites from the lowest conglomerate of the Cow Head Group, Broom Point, western Newfoundland, 1982-83; M.Sc. thesis (Young).

The principal aim is the systematics of 1300 specimens of approximately 20 to 30 species of Middle Cambrian trilobites from the lowest conglomerate of the Cow Head Group, Broom Point, western Newfoundland. These prepared specimens are from 48 limestone boulders from the Kindle Collection, GSC. Secondary aims include trilobite biostratigraphy and paleoecology, trilobite distribution, associated fauna, and lithological associations.

VERTEBRATE/VERTÉBRÉS

776. BLACKWELL, B.L., RUTTER, N.W., Univ. Alberta (Geology):
Amino acid dating of bones and teeth from LaChaise Cave, Charente, France, 1980-84; Ph.D. thesis (Blackwell).

777. CARROLL, R.L., McGill Univ. (Redpath Mus.):
The origin of lizards, 1978-83.

Permo-Triassic reptiles of the Family Paliguanidae can be included in the stem group of the squamates on the basis of a streptostylic quadrate which supports the tympanum, and the small size of the intermedium. Early squamates share with sphenodontids ossified epiphyses which form specialized joint surfaces, an incipient mesotarsal joint and short fifth metatarsal, and impedance matching middle ear which suggest that they have a sister group relationship, and share a common ancestry distinct from primitive eosuchians. The hooked fifth metatarsal, coossification of the proximal tarsals and thyroid fenestration shared by modern squamates and sphenodontids were apparently convergently achieved in these two groups.

778. CARROLL, R.L., CURRIE, P.J., McGill Univ. (Redpath Mus.), Tyrrell Mus.:
Primary radiation of diapsid reptiles, 1978-84.

Most diapsides can be placed in one of two monophyletic groups, the Lepidosauria or the Archosauria on the basis of shared derived characters. Exceptions are the families Petrolacosauridae, Araeoscelidae and Coelurosauravidae which may be assigned to the common stem group of later diapsids. Antapomorphies of the vertebrae, carpus and tarsus unite protorosaurs and rhynchosaurs with archosaurs. The presence of a large sternum with which the coracoids articulate is a synapomorphy uniting eosuchians, lizards and sphenodontoids. Study of diapsid radiation was facilitated by the elaboration of a series of procedures for establishing relationships which combined cladistic methodology with an understanding of evolutionary processes as enunciated by Mayr and Simpson.

779. CARROLL, R.L., GASKILL, P., McGill Univ. (Redpath Mus.):
Origin of nothosaurs and plesiosaurs and the probable modes of their aquatic locomotion, 1976-85.

780. CARROLL, R.L., WILD, R., McGill Univ. (Redpath Mus.), State Museum, Stuttgart:
Description of the earliest known Pleurosaur (Sphenodontida), 1981-83.

781. EDMUND, A.G., Royal Ontario Mus. (Vert. Palaeontology):
Tertiary and Quaternary radiation of the giant armadillos (Pampatheriidae: Mammalia) in South America, 1964-85.

Work continues on the analysis of data collected during late 1981 in South American museums. At least two new species are recognized, and new phylitic lineages proposed. A large proportion of specimens from lower Pleistocene to Rancholabrean constitute a single lineage with perhaps two genera. Recently published absolute datings by others are helping to place population in a more reliable time frame.

782. EDMUND, A.G., Royal Ontario Mus. (Vert. Palaeontology):
Osteology, taxonomy and distribution of the giant ground sloths of the genus Eremotherium (Xenarthra, Mammalia), 1964-85.

Specimens from a newly described sinkhole in Brasil agree fairly well with those being described from Daytona Beach, Florida, and with two skeletons recently found in South Carolina. Closer analysis may reveal that a single species, **E. laurillardi** (Lund 1848) ranged from Brasil and Peru as far north as New Jersey.

783. EDMUND, A.G., Royal Ontario Mus. (Vert. Palaeontology):
Osteology and functional morphology of the Pleistocene giant armadillo **Holmesina septentrionalis** (Pampatheriidae, Xenarthra, Mammalia), 1965-83.

Work continues on the monograph, with progress being made on the basicranium and ear region, as well as illustrations of other areas.

784. EDMUND, A.G., Royal Ontario Mus. (Vert. Palaeontology):
Evolution of a single phyletic line of giant armadillos (Pampatheriidae, Mammalia) in Florida during the Pleistocene, 1975-82.

Most of the work is completed and shows a chronocline extending from **Holmesina floridanus** of the Blancan to **H. septentrionalis** of the Rancholabrean. As well as a general increase in size, there is a gradual morphological change in the astragalo-calcaneal articulation.

785. EDMUND, A.G., Royal Ontario Mus. (Vert. Palaeontology):
New species of giant armadillos (Pampatheriidae, Edentata) from the Late Pleistocene of Texas and Mexico, 1977-84.

The material from Puebla, Mexico is indistinguishable from material of the same age in eastern South America and will probably be described under the genus Vassallia. Other specimens from Mexico and Texas may belong to **Holmesina**, but show considerable differences from the Florida population.

786. EDMUND, A.G., Univ. Toronto (Geology):
Study of deposits containing Pleistocene vertebrates in Charlotte and Sarasota Counties, Florida, 1978-.

Field work continues as new canals and borrow pits are constructed in the area. A display illustrating process and problems, involving both marine and terrestrial organisms, is being prepared for the Royal Ontario Museum.

787. EDMUND, A.G., Royal Ontario Mus. (Vert. Palaeontology):
Body armour of the giant armadillos (Pampatheriidae, Xenarthra, Mammalia), 1980-83.

Study of several incomplete carapaces of North and South American pampatheres has revealed considerable variations in the morphology of the osteoderms in different parts of the body. A paper describing a typical composite carapace and the specialized osteoderms of the remaining armour (cephalic casque, caudal rings, limbs, etc.) is in preparation.

788. GODFREY, S.J., CARROLL, R.L., McGill Univ. (Redpath Mus., Biology):
Skeletal morphology of **Greererpeton burkemorani**, the oldest North American temnospondyl amphibian, 1981-85; Ph.D. thesis (Godfrey).

To describe the postcranial skeletal anatomy of **Greererpeton burkemorani** (Romer, 1969), the oldest North American temnospondly amphibian. The phylogenetic significance of this amphibian becomes apparent by the extreme paucity of Devonian and Lower Carboniferous tetrapods. The research will include an analysis of ontogenetic differences manifested in the skulls and skeletons of these amphibians, as well as the functional morphology of adequately preserved elements.

789. McDONALD, H.G., EDMUND, A.G., Univ. Toronto (Geology), Royal Ontario Mus. (Vert. Palaeontology):
A description of **Scelidodon** from the Pleistocene tar seeps of Ecuador and Peru, and review of the scelidotheres (Mylodontidae, Mammalia), 1978-84; Ph.D. thesis (McDonald).

McDonald has now examined all scelidothere and related material in North American institutions and is spending the first part of 1983 at European museums, where there are large relevant collections. Preliminary analysis of the mass of cranial data indicates the need for a thorough revision of the taxonomy of the family Mylodontidae.

790. MADDEN, C.T., STORER, J.E., Denver Museum Nat. Hist., Saskatchewan Museum Nat. Hist.:
Proboscidea of the Wood Mountain Formation (Barstovian) of southern Saskatchewan, 1981-83.

A manuscript on Wood Mountain **Zygolophodon** and **Gomphotherium** is nearing completion.

791. MOSSMAN, D.J., Mount Allison Univ. (Geology):
Vertebrate footprints from Mississippian and Pennsylvanian sediments of Nova Scotia – compilation and description of all known forms, 1974-.

See:
Footprints of extinct animals; Scientific American, vol. 248, no. 1, p. 74-83, 1983.

792. RUSSELL, L.S., Univ. Toronto (Geology), Royal Ontario Mus. (Vert. Palaeontology):
The Cretaceous-Tertiary transition in central Alberta, 1976-84.

The Cretaceous-Tertiary transition exposed in the valley of Red Deer River in east-central Alberta has been under study since 1976, concentrating on the Scollard Formation, the uppermost component of the Edmonton Group. It is generally agreed that the Cretaceous-Tertiary transition lies within this formation. By a combination of instrumental surveys and direct measurements a complete stratigraphic section of the formation has been compiled. This includes the highest known occurrence stratigraphically of dinosaur remains in lower Scollard beds and a shell bed of Paleocene mollusks in the upper Scollard. The Cretaceous-Tertiary boundary is presumed to occur within the 20-metre interval between these two horizons.

During the 1982 field season the search for diagnostic fossils in the Scollard Formation was continued, adding to the variety of identifiable dinosaurs in the lower beds and of mollusks in the upper. Stratigraphic sections at various localities were recorded to determine the lateral variations within the Scollard Formation and to test the conclusion that a time gap is represented by the contact of the Scollard on the underlying Battle Formation. Rock samples were taken at vertical intervals for palynological analysis and for tests for rare minerals. This new material is under study.

793. SARJEANT, W.A.S., MOSSMAN, D.J., LEONARDI, G., Univ. Saskatchewan (Geological Sciences):
Terrestrial palaeoichnology – general studies, 1981-83.

See:
In the footsteps of the dinosaurs; Explorers J., vol. 59, no. 4, p. 164-171, 1982.

Further vertebrate footprints from the Lower Permian sandstones of Cumbria; Proc. Cumberland Geol. Soc., vol. 4, pt. 2, p. 111-114, 1982.

The footprints of extinct animals; Scientific Amer., vol. 248, no. 1, p. 74-83, 1983.

Preparation of a benchmark volume on Terrestrial Trace-Fossils (now in press, Hutchinson Ross: Stroudsburg, Pennsylvania). Preparation of a multi-language glossary of the terminology applied to fossil vertebrate footprints, with G. Leonardi.

794. SEYMOUR, K.L., EDMUND, A.G., Univ. Toronto (Geology), Royal Ontario Mus. (Vert. Palaeontology):
The Felinae from the Pleistocene tar seeps of Talara, Peru, 1981-83; M.Sc. thesis (Seymour).

Comparison with both fossil and recent large cat material in North American collections confirmed that the large cat is actually a jaguar, **Panthera onca** rather than **P. antros**. Statistical and morphological analyses are being applied to the large sample to determine the validity of the many subspecific names given to modern and fossil specimens or populations. The smaller cat material from Talara is referrable to margay and ocelot.

795. SKWARA WOOLF, T., KUPSCH, W.O., Univ. Saskatchewan Dept. (Geological Sciences):
Paleontology and paleoecology of Tertiary (early Miocene) vertebrates from southestern Saskatchewan, 1979-84; Ph.D. thesis (Skwara Woolf).

Hemingfordian (early Miocene) vertebrate fossils, collected from sediments occurring at the top of the Cypress Hills Formation, southwestern Saskatchewan have been identified and described. The Miocene fossil bearing sediments are indistinguishable from the underlying Chadronian (Oligocene) fossil bearing sediments.

Paleocological and paleobiogeographic interpretations are currently being undertaken. Biostratigraphic correlation with sediments containing fossils of similar age both in the rest of North America and in Europe will be undertaken.

The 1983 field season will be spent in Yukon prospecting for Tertiary plants and animals, in the hopes of unraveling the paleobiogeographical problems – determining if and when interchange of vertebrates occurred between Europe and North America in Tertiary time.

796. STORER, J.E., Saskatchewan Museum Nat. Hist.:
Oligocene mammals of the Cypress Hills Formation (Chadronian) of Saskatchewan, 1978-.

Voir:
Oligocene multituberculates (Mammalia: Allotheria): youngest known record; J. Paleontol., vol. 56, no. 3, p. 791-794, 1982.

1982 work to be published includes a review of the early Chadronian Southfork Local Fauna and description of a new species of **Heptacodon** (Anthracotheriidae) from Lac Pelletier. An attempt will be made to establish additional local faunas from the Cypress Hills Formation.

797. STORER, J.E., Saskatchewan Museum Nat. Hist.:
Eocene mammals of the Cypress Hills Formation (Uintan), Swift Current region, Saskatchewan, 1980-83.

The Swift Current Creek Local Fauna contains 51 species of fossil mammals. A manuscript on the fauna is nearing completion.

798. WELLSTEAD, C.F., CARROLL, R.L., McGill Univ. (Redpath Mus., Biology):
Taxonomic revision of the extinct amphibian families Lysorophidae and Molgophidae, 1977-83; Ph.D. thesis (Wellstead).

PALEOBOTONY/PALYNOLOGY/ PALÉOBOTANIQUE ET ANALYSE POLLINIQUE

799. ACHAB, A., INRS-Géoressources:
Chitinozoaires de l'Ordovicien inférieur et moyen du Québec, 1979-85.

Voir:
Chitinozoaires de l'Arenig supérieur (zone D) de la Formation de Lévis, Québec, Canada; Can. J. Earth Sci., vol. 19, p. 1295-1307, 1982.

Reconnaissance des principaux assemblages de chitinozoaires de l'Ordovicien inférieur et moyen du Québec. Leur succession est mise en relation avec la zonation établie à l'aide des graptolites.

800. ACHAB, A., INRS-Géoressources:
Biostratigraphie par les chitinozoaires de l'Ordovicien supérieur Silurien inférieur de l'île Anticosti, Québec, 1980-84.

Voir:
Palynological changes at the Ordovician Silurian Boundary on Anticosti Island, Quebec; Paleont. Contr. Univ. Oslo, vol. 280, no. 3, 1982.

Contribution de l'étude de chitinozoaires à la définition de la limite entre l'Ordovicien et le Silurien. Étude des principaux assemblages caractéristiques du Silurien inférieur.

801. BARSS, M.S., Geol. Surv. Can.:
Palynological zonation of the Carboniferous and Permian rocks of Atlantic Provinces, Gulf of St. Lawrence and Northern Canada, 1968-.

802. BASINGER, J.F., SCHECKLER, S.E., DILCHER, D.L., HILLS, L.V., BLACKBURN, D.L., Univ. Saskatchewan (Geological Sciences):
Cretaceous and Tertiary plants of western and Arctic Canada. Late Devonian plants of the Yukon, 1981-.

The ongoing study of the Cretaceous and Tertiary plants of western Canada is progressing well with the recovery and preliminary investigation of a large collection of megafossils from the Eureka Sound Formation, Ellesmere Island. A low diversity flora, including angiosperms, gymnosperms, ferns, and **Equisetum** is associated with coal-bearing, Paleocene sediments in the lower part of the formation. Work on the Paleocene Ravenscrag Formation of Saskatchewan and Eocene coal-bearing basins of British Columbia is continuing.

A new project, on Late Devonian fossil plants from the Earn Group, Yukon, was initiated during 1982. Fossil plants are associated with lead-zinc ore bodies of the Earn and are the only identifiable fossils in the metamorphosed sediments. The principle component of the flora, **Archaeopteris fissilis**, has helped establish a Frasnian age for the deposits and is useful in correlation and mineral exploration in the area.

803. BÉLIVEAU, M., GEURTS, M.A., Univ. Ottawa (Géographie):
Palynologie de surface et des sols forestiers dans le parc de la Gatineau, Québec, 1980-83; thèse de maîtrise (Beliveau).

Levé écologique corrélation entre palynologie de surface et levé écologique. Une succession végétale peut elle se retrouver par le palynologie dans un sol forestier.

804. BUJAK, J.P., Geol. Surv. Can.:
D.S.D.P. dinoflagettates, 1981-.

805. DAVIES, E.H., Geol. Surv. Can.:
Biostratigraphy of the Atlantic Shelf and relevant areas, 1981-.

806. DAVIES, E.H., Geol. Surv. Can.:
Taxonomy, phylogeny and ecology of palynomorphs, 1981-.

807. DONALDSON, J.A., HORODYSKI, R.J., Carleton Univ. (Geology), Tulane Univ.:
Stromatolites and microfossils of the Dismal Lakes Group, Northwest Territories, 1977-84.

Voir:
Distribution and significance of microfossils in cherts of the Middle Proterozoic Dismal Lakes Group, District of Mackenzie, Northwest Territories, Canada; J. Paleontol., vol. 57, no. 2, p. 271-288, 1983.

808. EDLUND, S.A., Geol. Surv. Can.:
Vegetation distribution and relationships to surficial materials, Arctic Canada, 1976-.

Voir:
Bioclimatic zonation in a High Arctic region: central Queen Elizabeth Islands; Geol. Surv. Can., Paper 83-1A, p. 381-390, 1983.

809. ELEY, B.E., VON BITTER, P.H., Royal Ontario Mus. (Invert. Palaeontology):
The stratigraphic, petrographic and palynologic characteristics of chert as utilized by southern Ontario's early inhabitants, 1982-89.

Voir:
Chert in the Middle Silurian Fossil Hill Formation of Manitoulin Island, Ontario; Bull. Can. Petrol. Geol., vol. 30, no. 3, p. 208-215, 1982.

810. FENSOME, R.A., NORRIS, G., Univ. Toronto (Geology):
Taxonomy and biostratigraphy of Cretaceous (Aptian-Cenomanian) dinoflagellates, Scotian Shelf, offshore eastern Canada; 1981-.

Research on dinoflagellate biostratigraphy from the mid-Cretaceous parts of three sections from three wells (Mississauga, Wyandot and Triumph) of the Scotian Shelf continues. Miospores have now also been included in this study, and the assemblages of these fossils from the Scotian Shelf have been compared with those from the Mattagami Formation in the Moose River Basin of Ontario. These comparisons along with consideration of the Scotian Shelf dinoflagellates, indicate that the Mattagami Formation is mainly of Albian age, but may also in part be of Aptian and early Cenomanian age.

811. GEURTS, M.A., Univ. Ottawa (Géographie):
Palynostratigraphie du Toudiglaciaire et du Postglaciaire, Yukon et Territoires du Nord-Ouest, 1981-86.

Voir:
Les formes d'effondrement et le mode de déglaciation de la région du Lac Quinaluk, T.N.O. Canada; Géographie Physique et Quaternaire, vol. 36, nos. 1-2, p. 233-240, 1982.

Pluie pollinique estivale dans la Ruby Range (en préparation). Palynologie de surface dans la Ruby Range (Yukon). Paléoenvironmental végétal de la Basse Coppermine (TNO). Interprétation des spectres pollinique en cours.

Nouveau: Impact du dépôt des cendres White River Ash sur la végétation (en préparation).

Achevé: Palynologie et morphogenese récent dans le bassin du Grizzly Creek.

812. GUAY, F.R., GEURTS, M.A., Univ. Ottawa (Géographie):
Contribution à l'étude palynologique des dépôts continentaux dans la vallée de la Coppermine (TNO), 1980-83; thèse de maîtrise (Guay).

Evolution du paléoenvironnement végétal par l'analyse pollinique des dépôts mineraux et organique depuis 8400 BP et corrélations avec l'evolution géomorphologique et paleoclimatique de la vallée de la Coppermine.

813. HOPKINS, W.S., JR., Geol. Surv. Can.:
Mesozoic and Tertiary continental microflora from Northwest Territories. Yukon Territory, British Columbia, Alberta, 1979-.

814. KRAMER, C.L., NORRIS, G., Univ. Toronto (Geology):
Palynostratigraphy of the Eureka Sound Formation, Ellesmere and Axel Heiberg Islands, Northwest Territories, 1980-83; M.Sc. thesis (Kramer).

Ninety-three samples from a 3200 metre section of the Eureka Sound Formation near Strand Fiord, Axel Heiberg Island and thirty-one samples from 1306 metres of the same formation north of Vesle Fiord, Ellesmere Island have been investigated for palynomorphs. Taxonomic assignment of many of the predominantly terrestrial palynomorphs present has been made and assignment of the remaining specimens is imminent. A tentative palynostratigraphic zonation has been developed for the Strand Fiord section which is Maastrichtian to ?Lower Eocene in age. This zonation will be refined as more taxonomic assignments are made. The Vesle Fiord section will be correlated with the Strand Fiord section based on the palynomorph zonation. Current indications are that the basal Eureka Sound (Formation) is younger (?Paleocene) at Vesle Fiord. Correlation will ultimately be made with rocks of a similar age throughout the Arctic.

815. LEGAULT, J.A., DUFFIELD, S.L., MELCHIN, M., Univ. Waterloo (Earth Sciences):
Paleozoic palynostratigraphy of Canada, 1976-; Ph.D. thesis (Duffield), M.Sc. thesis (Melchin).

See:
Gradational morphological series in Early Silurian acritarchs from Anticosti Island, Quebec; Third North Amer. Palentol. Convention, Proc. vol. 1, p. 137-141, 1982.

First report of Ordovician (Caradoc-Ashgill) palynomorphs from Orphan Knoll, Labrador Sea; Can. J. Earth Sci., vol. 19, no. 9, p. 1851-1856, 1982.

816. LICHTI-FEDEROVICH, S., Geol. Surv. Can.:
Diatom analysis and paleoecological studies of Quaternary sediments, 1972-.

See:
Contribution to the diatom flora of Arctic Canada: Report 3. On the occurrence of **Chaetoceros** spp. fo. **clavipes** in the southern Beaufort Sea; Geol. Surv. Can., Paper 82-1B, p. 169-171, 1982.

817. McGREGOR, D.C., Geol. Surv. Can.:
Silurian and Devonian spores of Canada, 1975-.

See:
Middle Devonian miospores from the Cape de Bray, Weatherall, and Hecla Bay formations of northeastern Melville Island, Canadian Arctic; Geol. Surv. Can., Bull. 348, 1982.

818. McINTYRE, D.J., Geol. Surv. Can.:
Upper Mesozoic and Cenozoic palynology of western and northern Canada, 1982-.

819. MAO, S., NORRIS, G., Univ. Toronto (Geology):
Upper Cretaceous and Palaeogene dinoflagellate cysts and acritarch of the Kashi area basin, Xingjiang Province, China, 1981-83.

Rich microfloras have been obtained from three sections of the Upper Cretaceous Kukebai, Wuyitake and Tuyiluoke formations, the Paleocene Altashi and Qumugen formations, the Eocene Gaijitage, Kalatar, Walagen and Zhuoyouleigansu formations, and the Oligocene Bashibulake formation. Two hundred dinoflagellate and acritarch taxa have been distinguished including twenty-eight new species. Six Oppel zones are recognized. Comparison of dinoflagellate assemblages between the study area and other areas, especially with England, facilitate dating of the zones. Previous ages based on invertebrates are confirmed and refined in the present work.

An attempt has been made to reconstruct palaeogeography and palaeoecology. Dinoflagellate floras indicate that a marine connection existed between the study area and the Tethys during Late Cretaceous and Palaeogene times. Combined palynologic and other palaeontologic and geologic evidence indicate three trangressions and regressions in the studied interval.

820. MOTT, R.J., Geol. Surv. Can.:
Quaternary palynology, 1969-.

821. OUIMET, D., GEURTS, M.A., Univ. Ottawa (Géographie):
Palynologie des argiles de la mer de Champlain dans le Canton de Cumberland (Est Ontario), 1979-83; thèse de maîtrise (Ouimet).

Etude des corrélations entre palynologie des argiles marines et la palynostratigraphie régionale. Essai d'utilisation des argiles pour la palynostratigraphie du tardiglaciaire.

822. SARJEANT, W.A.S., KENNEDY, J.E., DELAIR, J.B., Univ. Saskatchewan (Geological Sciences):
Supplement to the bibliography of works on the history of geology, 1980-85.

See:
Joseph B. Reade (1801-1870) and the earliest studies of fossil dinoflagellate cysts in England; J. Micropalaeontol., vol. 1, p. 85-93, 1982.

"Earthquakes in the air": the seismological theory of John W. Flamsteed (1693); J. Royal Astronomical Soc. Can., vol. 76, no. 4, p. 213-223, 1982.

Preparation of the Supplement to Geologists and the History of Geology: An International Bibliography from the Origins to 1978 has been actively begun. This has involved research in the Geological Survey of Canada Library in Ottawa. Work on Pentland's correspondence is continuing in association with Delair, particular attention is being paid to Pentland's correspondence with J.D. Forbes.

823. SARJEANT, W.A.S., LACALLI, T., WALL, D.A., FENSOME, R.A., WHEELER, J.W., Univ. Saskatchewan (Geological Sciences):
Study of European type material of dinoflagellate cysts from the Jurassic, Cretaceous and Tertiary of Germany and Belgium, 1980-83.

See:
The dinoflagellate cysts of the **Gonyaulacysta** group: a morphological and taxonomic restudy; AASP Contrib. Ser. no. 9, 1982.

Dinoflagellate cyst terminology: a discussion and proposals; Can. J. Botany, vol. 60, no. 6, p. 922-945, 1982.

Dinoflagellate cysts from the Middle and Upper Oligocene of Tonisberg (Niederrheingebiet): a morphological and taxonomic restudy; Nova Hedwigia, vol. 35, p. 313-356, 1982.

During the past year further work has been completed on the study of European type material from the Jurassic, Cretaceous and Tertiary (Eocene-Miocene) strata of Germany and Belgium. In association with Lacalli, studies of the morphological and palaeoecological significance of structures in dinoflagellate cysts have been undertaken, including some experimental work. A restudy of the taxonomy of the **Gonyaulacysta** group has been completed.

Fensome is in the final stages of completion of his work on spore-pollen assemblages from the Jurassic – lowest Cretaceous of the Yukon and Northwest Territories, and Wheeler has completed his work on the Jurassic – lowest Cretaceous of the Alborz Mountains, Iran. Wall is presently studying assemblages from Recent sediments of the California Current.

824. SINGH, C., Alberta Research Council (Geol. Surv.):
Cenomanian microfloras of the Peace River district, Alberta, 1969-82.

Manuscript has been completed and in press.

825. SINGH, C., Alberta Research Council (Geol. Surv.):
Late Cretaceous – Tertiary microfloras, west-central Alberta, 1970-84.

826. SINGH, C., Alberta Research Council (Geol. Surv.):
Palynological study of the coal-bearing Late Cretaceous strata in the Red Deer River Valley, Alberta, 1973-84.

827. SWEET, A.R., Geol. Surv. Can.:
Palynological studies of Mesozoic and Tertiary coal measures in western and northern Canada, 1971-.

828. SWEET, A.R., Geol. Surv. Can.:
Taxomony and biostratigraphic distribution of Mesozoic and Paleogene megaspores, 1979-.

829. UTTING, J., Geol. Surv. Can.:
Palynology of Carboniferous, Permian and Triasic rocks of northern and western Canada, 1981-.

830. ZIPPI, P., NORRIS, G., Univ. Toronto (Geology):
Triassic palynostratigraphy of the eastern Sverdrup Basin, Ellesmere Island, Northwest Territories, 1982-85; Ph.D. thesis (Zippi).

Detailed collections and measurements of sections were made (summer 1982) from the Middle and Upper Triassic Blaa Mtn.-Schei Pt Formations of Ellesmere Island. Standard maceration techniques have been used on a representative selection of samples. Microscopic investigation indicates the presence of abundant miospores acritarchs and few megaspores. The optimum extraction technique for samples from the basinal sections has just been developed.

Palynological analyses will be made and the results of species distributions and abundances will be recorded. From these results biostratigraphic interpretations, correlations and age determinations will be made using a variety of quantitative biostratigraphic methods. The integration of this biostratigraphic and paleoecologic information with the lithostratigraphic and sedimentological information of other researchers in the area will help achieve correlations between and across facies in the Sverdrup Basin.

EXPERIMENTAL/EXPÉRIMENTAL

831. BRYNDZIA, L.T., SCOTT, S.D., Univ. Toronto (Geology):
The composition of chlorite along the join daphnite-clinochlore, as a function of sulfur and oxygen fugacity: A study of sulfide-silicate reactions, 1981-84; M.Sc. thesis (Bryndzia).

Synthetic and natural chlorites whose compositions lie on the join daphnite-clinochlore have been subjected to oxidation-sulfidation reactions under controlled fO_2-fS_2 conditions. The experimental configuration employed in these reactions are of the triple-layer, tube-in-tube type, which permit experimental reversals to be obtained within any single experimental run, under identically buffered fO_2-fS_2 conditions.

The fO_2-fS_2-T-P-X data for chlorites is required to permit experimental calibration of chlorite activity-compositional relationships. This data is vital if chlorite probe data is to be amenable to thermodynamic manipulation and application to natural occurrences, particularly in the content of metamorphosed massive sulfide deposits.

832. ENGI, M., Univ. British Columbia (Geological Sciences):
Olivine-spinel geothermometry, 1975-83.

833. ENGI, M., EVANS, B.W., Univ. British Columbia (Geological Sciences):
Stability of minnesotaite and greenalite, 1981-83.

See:
Stability of minnesotaite; Geol. Soc. Amer., Abstracts with Program, vol. 14, no. 7, p. 485, 1982.

Cold seal hydrothermal experiments in the system Fe-MgO-SiO_2-C-O-H and using weak electrolyte fluids (iodides) were designed to investigate metastable phase relations of Fe-rich silicates pertinent to low-grade metamorphic iron formations. Our data are analyzed in conjunction with other available experimental results as well as constraints imposed by natural phase relations. Internally constitent thermochemical properties thus derived for minnesotaite, greenalite, grunerite et al. allow the calculation of the complete phase relations (at any desired stability level). Resulting stable PH_{2O}-T and T-X_{CO_2} diagrams compare very well with inferences from the field.

The quantitative computation of the various metastable states attained in the experiments appears to be not only useful at the design-stage of critical and feasible experiments, but is in fact crucial to the correct interpretation of the observed stability relations.

834. McPHAIL, D.C., GREENWOOD, H.J., Univ. British Columbia (Geological Sciences):
Fe-Mg solution in chlorites, 1982-83; M.Sc. thesis (McPhail).

Study of Fe-Mg solution in the chlorite mineral group through chlorite-garnet exchange equilibria. Synthetic starting materials are used with standard cold seal pressure vessels at temperature of 400-700°C and 2kba for experiments.

835. RAUDSEPP, M., TURNOCK, A.C., Univ. Manitoba (Earth Sciences):
The synthesis of amphibole group minerals and the variation of their crystal-chemical properties, 1980-84; Ph.D. thesis (Raudsepp).

See:
Synthesis and characterization of Vi_B^{3+} analogs of pargasite and eckermannite; Geol. Assoc. Can. – Mineral. Assoc. Can., Program with abstracts, vol. 7, p. 75, 1982.

The synthesis of analogs of pargasite, fluor-pargasite, eckermannite and fluor-eckermannite have been attempted, with Vi_B^{3+} = Sc, Ti, V, Cr, Mn, Fe, Ga, In. materials Starting materials were reagent oxides, carbonates, and fluorides. Gel mixtures were also used, and produced similar results. Greater than 95% yields were achieved of amphiboles of composition pargasite, fluor-pargasite, eckermannite, fluor-eckermannite, and the Sc and Cr analogs of paragasite and fluor-pargasite. Yields of transition-metal analogs of eckermannite were 50 to 75%. The variation of cell-parameters with substitution, and infra-red spectra, have been analyzed.

836. SPRY, P.G., SCOTT, S.D., Univ. Toronto (Geology):
Synthesis and stability of zincian spinels, 1978-83; M.Sc. thesis (Spry).

See:
An unusual gahnite-forming reaction, Geoc base-metal deposit, Manitouwadge, Ontario; Can. Mineral., vol. 20, p. 549-553, 1982.

Zincian spinels ([Zn, Fe, Mg] Al_2O_4) are common constituents of metamorphosed base metal sulfide deposits and of some aluminous metasediments, marbles and pegmatites. They can form either from sphalerite or from reactions with a variety of ferromagnesian silicates including biotite, staurolite, amphibole and garnet. Spinels associated with base metal deposits, marbles and aluminous metasediments are enriched in the gahnite ($ZnAl_2O_4$), spinel ($MgAl_2O_4$) and hercynite ($FeAl_2O_4$) molecule, respectively, whereas those associated with pegmatites are depleted in the spinel molecule. Such variability in composition with environment constitutes an exploration guide for metamorphosed sulfide deposits.

The composition of spinels in pegmatites, marbles and aluminous metasediments is controlled largely by that of the host rocks. In base metal sulfide deposits P,T, fO_2 and fS_2 are the primary factors determining composition. Many spinels in and near sulfide deposit have formed in the presence of Al-bearing silicates and pyrrhotite (with or without pyrite) by desulfidation reactions of the type $xZnS + (1-x)\ FeS + Al_2O_3 + \frac{1}{2}O_2 =$ reactions for a given P-T the fO_2 and fS_2 conditions can be determined by the spinel composition. Experimental reversals of the above reaction have been obtained at 2kb utilizing $FeS_2 + Fe_{1-x}S + Fe_3O_4$ as a buffer.

IGNEOUS/ROCHES IGNÉES

837. BACHINSKI, S.W., BACHINSKI, D.J., Univ. New Brunswick (Geology):
Lamprophyres associated with the Lake George antimony deposit, New Brunswick, 1980-84.

838. BARAGAR, W.R.A., Geol. Surv. Can.:
Stratigraphy and petrology of the Natkusiak Basalts, Victoria Island, District of Franklin, 1975-.

See:
A Rb-Sr study of the Natkusiak Basalts, Victoria Island, District of Franklin; Geol. Surv. Can., Paper 82-1C, p. 167, 168, 1982.

839. BARR, S.M., MACDONALD, A.S., Acadia Univ. (Geology):
Granitoid plutons and associated mineral deposits, Cape Breton Island, Nova Scotia, 1978-.

See:
Geology and geochemistry of selected granitoid plutons of Cape Breton Island; Nova Scotia Dept. Mines and Energy, Paper 82-1, 1982.

Granitoid and associated basement and/or volcanic rocks in 15 areas of Cape Breton Island have been mapped (scale 1:20,000) and sampled for petrological studies. Subsequent investigations in these areas have included geochemistry, age dating, and studies of associated mineral occurrences, and have generally involved graduate students at Acadia University. Descriptions of the areas mapped to date have been published or are in preparation.

840. BOURNE, J., BIRON, S., Québec Ministère Énergie et Ressources:
Pétrologie et chimie des amas granitiques de l'Estrie, Québec, 1983-86.

841. CAMPBELL, I.H., LESHER, C.M., Univ. Toronto (Erindale, Earth and Planetary Sciences):
Rare earth elements in acid volcanics associated with Cu-Zn massive sulphide mineralization, 1982-84.

See:
Rare earth elements in volcanic rocks associated with Cu-Zn massive sulphide mineralization: a preliminary report; Can. J. Earth Sci., vol. 19, p. 619-623, 1980.

The principal aims are to 1) verify preliminary observations that ore-bearing felsic volcanics are geochemically different from barren felsic volcanics, and 2) interpret those variations in terms of the ore-forming process. Preliminary results indicate that felsic volcanics associated with several Canadian Cu-Zn massive sulphide deposits exhibit flat REE distribution patterns and significant Eu anomalies compared with barren felsic volcanics which exhibit steep REE patterns and weak to absent Eu anomalies. These appear to be original geochemical signatures related to the magmatic history of the two associations. The expanded data base will include a larger number of Canadian deposits and several Australian and Scandanavian deposits, as well as a larger number of samples from barren felsic volcanic sequences.

Two other aspects of this work have important implications for massive sulfide exploration; the effects of alteration on REE mobility and the role of subvolcanic magma chambers. A study of REE in the alteration pipes below some massive sulfide deposits has shown clear evidence of REE mobility, with the middle REE, centered on Tb-Dy being the most mobile. The mobilized REE are the exact compliment of those deposited in hydrothermal U deposits. Further, our study suggests that the REE are mobile only under conditions which produce extreme alteration, and are therefore a potential tool for identifying the high intensity alteration associated with major massive sulfide deposits. Trace element geochemistry has also been used to show that plutons below the ore deposits are the subvolcanic magma chambers which fed the overlying volcanics and provided the heat engine which drove the ore-forming hydrothermal system. Subvolcanic magma chambers are therefore an essential part of the ore-forming system.

842. CAVELL, P.A., SMITH, D.G.W., Univ. Alberta (Geology):
The mineralogy and petrogenesis of the Bigspruce Lake alkali syenite complex, Northwest Territories, 1981-85; Ph.D. thesis (Cavell).

The Bigspruce Lake alkaline syenite complex located at 63°55'N, 115°55'W has been remapped and sampled in preparation for detailed analytical studies. The planned studies include electron microprobe analysis of mineral phases, determination of whole-rock compositions, analysis of REE and stable isotope (^{18}O) variations in selected samples and, finally, determination of the age of the complex using the Nd-Sm method.

843. CERNY, P., FRYER, B.J., LONGSTAFFE, F.J., TAMMEMAGI, H., CLARK, G.S., Univ. Manitoba (Earth Sciences):
The Lac du Bonnet batholith, southeastern Manitoba, 1975-83.

Phase composition, structure, mineralogy, petrochemistry, stable isotopes, Rb/Sr and REE study of the complex batholith indicate five major intrusive events of grossly different types of magmas.

844. COGULU, E., Univ. Ottawa (Géologie):
L'étude petro-chimique de l'intrusion gabbroique des Grands Lacs, Ontario, 1982-83.

La mise en place de l'intrusion fabbroique des Grands Lacs est en relation avec le magmatisme du complexe de Duluth (E.U.). Le massif possède une zone mineralisée de Cu-Ni-Pt à sa base et queiques niveaux chromifères au dessus du corps mineralisé des sulfures.

Les buts de la recherche sont: 1) étude de l'extension de l'intrusion sur le terrain; 2) étude pétrologique et géochimique des roches et des sulfures; et 3) comparaison avec d'autres massifs.

845. CURRIE, K.L., Geol. Surv. Can.:
Alkaline rocks in Canada, 1968-.

846. CURRIE, K.L., Geol. Surv. Can.:
Granite studies in the Appalachians, 1973-.

See:
The Topsails igneous terrane of western Newfoundland; Geol. Surv. Can., Paper 83-1A, p. 15-23, 1983.

A reconsideration of the Carboniferous rocks of Saint John, New Brunswick; ibid, p. 29-36, 1983.

847. DAVIDSON, A., Geol. Surv. Can.:
Granite studies in the Ennadai-Rankin Inlet region, District of Keewatin, 1966-.

848. DAVIDSON, A., Geol. Surv. Can.:
Granite studies in the Slave Province, District of Mackenzie, 1971-.

849. EMSLIE, R.F., Geol. Surv. Can.:
Geology, petrology and economic potential of the anorthosite suite in southern Labrador, 1975-.

850. EMSLIE, R.F., Geol. Surv. Can.:
Petrology, mineralogy, geochemistry and mineral potential of a Helikian non-organic granite suite in central Labrador and adjacent Quebec, 1979-.

See:
The coronitic Michael gabbros, Labrador: assessment of Grenvillian metamorphism in northeastern Grenville Province; Geol. Surv. Can., Paper 83-1A, p. 139-145, 1983.

851. FRENCH, V.A., BARR, S.M., Acadia Univ. (Geology):
Geology of the area northeast of Lake Ainslie, Cape Breton Island, Nova Scotia, 1982-84; M.Sc. thesis (French).

Mapping will cover areas of granitoid and volcanic rocks of inferred Late Precambrian and Devono-Carboniferous ages in the region between Lake Ainslie northeast to the Middle River area. Subsequent petrological and geochemical studies will focus on the granitoid rocks to clarify their ages, genetic relationships, petrogenesis, and relationship to mineral deposits in the area.

852. GARCIA, E., PEARCE, T.H., CLARK, A.H., Queen's Univ. (Geological Sciences):
Comparative petrology of andesites from the west coasts of North and South America, 1982-84; M.Sc. thesis (Garcia).

Special emphasis on Peru and Oregon to make a systematic compilation of petrographic features of selected andesites and to place constraints on the possible origin of these andesites through the methods of interpretive petrography.

853. KWONG, Y.T.J., British Columbia Ministry Energy, Mines, Petol. Res. (Geol. Sc.):
Evolution of the Iron Mask batholith and its associated copper mineralization, British Columbia, 1982-83.

To refine interpretation of major element geochemical data of the Iron Mask batholith and to elucidate in more detail the relationship of various mineralizations to the evolution of the batholith, a field investigation focussed on selected mineral occurrences and outcrops showing contact relationships of various rock units was conducted in the summer of 1982. Special attention was paid to the role of albitization, epidotization, K-feldspar and carbonate alteration in the copper ± precious metal mineralization process and to evidence of magmatic immiscibility as a possible process involved in the evolution of the batholith. Relevant trace element analyses will be conducted and the data be used as supporting evidence for various mechanisms proposed.

854. LAMBERT, M.B., Geol. Surv. Can.:
Archean volcanic studies in the Slave-Bear Province, District of Mackenzie, 1973-.

855. LAMBERT, M.B., Geol. Surv. Can.:
Archean felsic volcanic complex near Regan Lake, District of Mackenzie, Northwest Territories, 1974-.

856. McMULLIN, D., BARR, S.M., Acadia Univ. (Geology):
Plutonic rocks of the Loch Lomond area, southeastern Cape Breton Island, Nova Scotia, 1982-84; M.Sc. thesis (McMullin).

Mapping will cover areas of granitoid and volcanic rocks in Late Precambrian – Devonian ages in the Loch Lomond region. Subsequent petrological and chemical studies will focus on the granitoid rocks to clarify their ages, genetic relationships, petrogenesis, and possible relationship to Ba, Mn, and Pb deposits in the area.

857. MARTINS, V.M., GIBLIN, P.E., Queen Mary College, Univ. London, (Geology), Ontario Geol. Surv.:
Geology and geochemistry of a suite of granites intruding the Sudbury Igneous complex, Blezard and Snider tps., District of Sudbury, Ontario, 1981-84; Ph.D. thesis.

858. MEINTZER, R.E., WISE, M.A., CERNY, P., Univ. Manitoba (Earth Sciences):
The Yellowknife pegmatite field, Northwest Territories, 1980-85; Ph.D. thesis (Meintzer), M.Sc. thesis (Wise).

A study aimed at distriution, petrology, mineralogy and geochemistry of pegmatites and their parental granites within the framework of the structural, metamorphic and plutonic evolution of the Yellowknife basin. Petrogenesis of granitoid intrusions, genetic affiliation of the pegmatites and exploration guidelines for different types of mineralized pegmatites are the objectives including a regional review of mineralogy and crystal chemistry of accessory minerals of Nb, Ta, Ti and Sn. Field work and laboratory data collection were continuing in 1982.

859. MIRKOVICK, V.V., SOLES, J.A., BELL, K.E., EMR (CANMET):
Underground nuclear waste repository, 1977-86.

See:
Petrography of rock specimens from Stripa and Westerly granitic plutons, used for testing thermal properties in high pressure; CANMET Report ERP/MSL 82-57(TR), 1982.

Selection and preparation of rock specimens for thermophysical analyses; CANMET, Report ERP/MSL 82-62(OP and J), 1982.

Detailed petrographic analysis is an essential component of the evaluation of the significance of measurements of thermophysical properties of rocks.

860. NICHOLLS, J., STOUT, M.Z., Univ. Calgary (Geology and Geophysics):
Mineralogy and petrology of some British Columbia volcanics; origin of their magmas, inferred nature of the underlying upper mantle and heat effects of assimilation, crystallization and vesiculation of magmas, 1979-83.

A study of the mineralogy and petrology of 16 lava flows, the conditions of origin of their magmas and the inferred nature of the underlying upper mantle has been completed and a paper published.

Several of the flows studied (hawaiites) carry large megacrysts of feldspar and xenoliths of partially digested granite and granodiorite. A mass balance evaluation suggest these rocks are differentiation products of parent magmas (alkali olivine basalts). The classic hypothesis has been that the heat required for assimilation is generated by crystallizing thermally equivalent amounts of phases. To evaulate this energy balance, the heat effects of assimilation and crystallization have been investigated. A paper has been published on heat effects of assimilation, crystallization and vesiculation in magmas. The methods described in this paper have been used to investigate the formation processes of hawaiites from British Columbia and the results presented in a paper accepted for publication.

In addition, XRF data for 21 trace elements in the 16 lavas (and 40 rocks from other projects) has been collected. A study of the homogeneity of a single lava flow and the relationship between rock type and volcanic centre is presently underway.

861. NICHOLLS, J., STOUT, M.Z., Univ. Calgary (Geology and Geophysics):
Comparison of nephelinite lavas from oceanic and continental volcanic centres, 1980-84.

Electron microprobe analysis of minerals and chemical analysis of whole rock are continuing on ultramafic and alkalic lavas from the Canary Islands, Hawaiian Islands, Uganda and British Columbia.

Guinier camera X-ray data has been collected on analysed plagioclase megacrysts for a study of the relationship between order-disorder and the conditions of crystallization.

The implications of the presence of apatite and magnetite phenocrysts in Hawaiian hawaiites and trachytes but not in continental hawaiites is being studied to ascertain the processes that formed these rocks.

Epitaxial overgrowths on augite in Hawaiian tholeiites are being studied in order to place constraints on qualification of crystallization rates.

862. PADGHAM, W.A., VAN SCHMUS, W.R., BOWRING, S.A., Indian and Northern Affairs Canada:
Pegmatites in the Dog Rib Diabase dykes near Yellowknife, Northwest Territories, 1982-83.

Unusual "diabase" pegmatites in a wide "Dogrib Dyke" just north of Yellowknife have been sampled to provide a better age for this dyke swarm. It is hoped to obtain U-Pb age from zircons in one or other of the felsic phases of the dyke. These include coarse grained amphibole plagioclase – magnetite veins and irregular (late stage melt?) patches, and later dyke – normal pinkish albite aplites containing approximately 10% quartz, 5% calcite and traces of pyrite and epidote.

The mineralogy, petrology and petrogenesis of the pegmatite phases will be investigated and their structural relations to the enclosing diabase documented.

863. PEARCE, T.H., Queen's Univ. (Geological Sciences):
Applications of laser interference microscopy to geology, 1980–.

See:
Direct observations of feldspar zoning using laser interference microscopy; EOS, vol. 63, no. 45, p. 1136, 1982.

Observations of plagioclase phenocrysts from andesites using multiple frequency laser interference microscopy; Geol. Soc. Amer., Abstracts volume, 1982.

Multiple frequency laser interference microscopy: a new technique for mineralogy; Geol. Assoc. Canada – Mineral. Assoc. Can., Program with abstracts, vol. 7, p. 72, 1982.

Laser interference observations of plagioclase from Mt. St. Helens; ibid, p. 72, 1982.

I have developed and patented a new research facility at Queen's University. The equipment uses two lasers, a HeNe (red) and an argon-ion (blue, green) to produce 3 different colours simultaneously. The apparatus features a vibration-isolated, horizontal-light-path, microscope with a built-in Mach-Zehnder interferometer. Refractive index variations in transparent samples are visible as different shades of colour (or coloured fringes) and may be determined to a sensitivity of 0.0002. Using the argon-ion laser, a study of laser-induced fluorescence has been initiated. The equipment is suitable for holographic recording of microscopic features. Applications of holography to some geological problems will be studied in the near future.

864. SCHAU, M., Geol. Surv. Can.:
Volcanic rocks of the Prince Albert belt, Districts of Franklin and Keewatin, 1972–.

865. SCOATES, R.F.J., Manitoba Dept. Energy and Mines (Geol. Services Br.):
The Fox River Sill – a major stratiform intrusion, northwestern Manibota, 1975–83.

The Fox River Sill, a stratiform ultramafic-mafic complex forms an integral part of the Proterozoic Fox River Belt of northeastern Manitoba. In the western part of the Belt the Sill comprises two lobes or segments, each approximately 70 km long and separated by a gap of 12 km. Distinctive aeromagnetic anomalies east of the eastern segment, indicate that ultramafic rocks extend for another 120 km eastward, beneath Paleozoic cover rocks of the Hudson Bay Lowland. This produces an overall length in excess of 250 km indicating that the west lobe of Sill, which has been examined in some detail, represents a portion of a much larger, major stratiform intrusion. The Sill is slightly more than 2 km thick at the present erosional surface.

The Sill, which intrudes a siltstone, sandstone, argillite, shale sequence is divided into four zones. From base to top these are, Marginal Zone (270 m thick), Lower Central Layered Zone (875 m thick), Upper Central Layered Zone (925 m thick) and Hybrid Roof Zone (50 m thick). Each zone is characterized by distinctive lithologic units, and except for the Hybrid Roof Zone by distinctive lithologic units, and except for the Hybrid Roof Zone by distinctive cyclic arrangement of units. The intrusion is distinguished by a predominant ultramafic composition, more than 75 per cent of the Sill being composed of olivine-rich olivine cumulate rocks.

The intrusion is distinguished by well developed layering, and a composite section in the western part of the intrusion is composed of a minimum of 70 layers. This total does not include small-scale rythmic layers nor grain size graded layers, which are present, but of local significance. The layers constitute cyclic units, 35 being recognized in the composite section.

866. THOMAS, D., Saskatchewan Geol. Surv.:
Uranium metallogenic studies, Gillies Channel Formation, Martin Group, Saskatchewan, 1982–83.

The project comprises a geochemical and petrological study of basic volcanics and clastic sediments of the Gillies Channel Formation of the Martin Group to determine 1) the petrographic and chemical characteristics of the volcanics and thence their possible eruptive environment, 2) the nature of alteration events related to vein type pitchblende mineralization, and 3) the distribution of trace metals in the unaltered and altered volcanic and clastic rocks.

867. WILSON, A.C., PEARCE, T.H., Queen's Univ. (Geological Sciences):
Comparative petrography of basalts from different tectonic environments, 1980–83; M.Sc. thesis (Wilson).

To determine if there are distinctive textural features which might be indicative of those environments and which might survive metamorphic overprinting. Petrographic analysis of basalts from Quebec, Oregon, Washington, and New Brunswick has been down and a photographic catalogue has been compiled. Further work is continuing on oceanic and island arc rocks.

An attempt will be made to apply the results of this investigation to Archean basaltic rocks from the Abitibi Greenstone belt.

METAMORPHIC/ROCHES MÉTAMORPHIQUES

868. ANDREWS, A.J., OWSIACKI, L., STRONG, D.F., KERRICH, R., Ontario Geol. Surv.:
Petrology, stable isotopes and fluid inclusions of the Ag-CO-Ni arsenide vein deposits near Cobalt and Gowganda, Ontario, 1982–83.

See:
Ontario Geol. Surv., Misc. Paper 106, p. 207-209, 1982.

To characterize the probable source, transport medium, and depositional environment of the Ag-vein near Cobalt and Gowganda. It is approached on the basis of detailed mapping, sampling and petrographic examination of selected areas in these camps. Progress to date: detailed mapping; sampling; initial data on petrography stable isotopes and fluid inclusions.

869. ANDREWS, A.J., WALLACE, H., Ontario Geol. Surv.:
Alteration, metamorphism and gold deposits in Ontario: initial observations in the Red Lake area, 1982–83.

See:
Alteration, metamorphism, and structure associated with Archean, volcanic-hosted gold deposits: preliminary observations in the Red Lake District; Ontario Geol. Surv., Misc. Paper 106, p. 180–184, 1982.

To examine the nature and pattern of alteration and metamorphism in Archean greenstone belts, and determine the processes responsible. On this basis relate gold mineralization to the pattern and history of alteration/metamorphism. It is hoped that useful conceptual information and practical field data will result.

870. FRASER, J.A., Geol. Surv. Can.:
Metamorphism in the Canadian Shield, 1974–.

871. FROESE, E., Geol. Surv. Can.:
A survey of metamorphism in the Canadian Shield, 1978–.

See:
A reaction grid for potassium – poor pelitic and mafic rocks; Geol. Surv. Can., Paper 83-1A, p. 121-124, 1983.

872. FROESE, E., Geol. Surv. Can.:
Metamorphism in the Kisseynew Subprovince, 1980–.

873. GHENT, E.D., STOUT, M.Z., Univ. Calgary (Geology and Geophysics):
Geochemical and petrologic study of metamorphism, 1982–.

See:
Geothermometry and geobarometry of pelitic rocks, upper kyanite and sillimanite zone, Mica Creek area, British Columbia; Can. Mineral., vol. 20, p. 295-305, 1982.

A study of regional metamorphism in the Blue River area, British Columbia, is in progress. A study of low-grade metamorphism in the Mesozoic volcanic rocks near Terrace, British Columbia, has been initiated. We are also studying mixed volatile equilibria and Stout has initiated a study of fluid inclusions in pelitic metamorphic rocks from the kyanite zone.

874. GORDON, T.M., Geol. Surv. Can.:
Metamorphism of volcanic rocks, Crowduck Bay, Manitoba, 1980–.

875. JACKSON, V.A., RIVERS, T., Memorial Univ. (Earth Sciences):
Metamorphic and structural geology of the Keskarrah Bay area, Point Lake, Northwest Territories, 1981–83; M.Sc. thesis (Jackson).

Mapping is completed, and structural analysis is currently being written up. Mineral analysis will begin shortly and interpretation and writing up will take place during the summer and fall.

876. OWEN, V., RIVERS, T., Memorial Univ. (Earth Sciences):
Plutonic + tectonic evolution of the Grenville Front tectonic zone, Potties Bay, Labrador, 1982–85; Ph.D. thesis (Owen).

Field investigation continuing summer 1983, laboratory investigation in progress.

877. RAESIDE, R.P., Acadia Univ. (Geology):
Metamorphism of the Shelburne Complex, Nova Scotia, 1983–86.

Long-term aims: 1) systematic mapping of metamorphic culmination in western Nova Scotia; 2) definition of isograds in pelitic and calc-silicate rocks; and 3) determine the relationship between metamorphism and deformation and intrusion of granitoids.

Short-term aims: 1) reconnaissance mapping, familiarization with lithologies; 2) sampling and petrographic examination; and 3) identification of useful isograds.

878. TURNOCK, A.C., Univ. Manitoba (Earth Sciences):
The petrology of altered rocks in the Archean Bird River greenstone belt, Manitoba, 1982–83.

See:
Structure and metamorphism of the Archean Bird River greenstone belt; Geol. Assoc. Can. – Mineral. Assoc. Can., Program with abstracts, vol. 7, p. 83, 1982.

Occurrences of garnet-blastite, an unusual metamorphic rock rich in almandine garnet, were found in folded and metamorphosed (staurolite grade) rocks which include conglomerates, pelites, volcaniclastic siltstones, ironstones, banded iron formation, felsite, and massive sulfide (pyrrhotite). Garnet-blastite occurs as beds, as fracture-fillings in the felsite, and as matrix to felsite fragments in conglomerate. The working hypotheses for formation of garnet-blastite are 1) deposition of ironstone (chamosite) in lenses, some of which are mixed with conglomerates (re-deposition), and some of which works into fractures in sub-aqueous felsite, and 2) alteration of mafic volcaniclastic sediments during the hydrothermal stage associated with sulfide deposition. The mapping and petrography have shown a sequence of compositions from the most almandine-rich rocks to both pelites and to quartz-cummingtonite iron formations, thereby favoring hypothesis (1). Probe analyses of 3 garnets show negligible contents of Mn, which is permitted for sedimentary ironstones. More chemical analyses are in progress.

879. WICKS, F.J., Royal Ontario Mus. (Mineralogy and Geology):
Deformation histories as recorded by serpentinites, 1981-85.

See:
Deformation histories as recorded by serpentinites; Geol. Assoc. Can. – Mineral. Assoc. Can., Program with abstracts, vol. 8, p. A74, 1983.

The study has expanded to include not only the examination of serpentine mineral pseudomorphs formed passively after plastically deformed olivine and pyroxene, but also to include serpentine minerals that have been actively involved in both brittle and ductile failure during deformation.

880. WICKS, F.J., OZORAY, J., WAN, Pu., SCHANDL, E.S., Univ. Toronto (Geology), Royal Ontario Mus. (Mineralogy and Geology):
Mineralogy and geochemistry of the chrysotile asbestos deposits of Ontario, 1982-85.

See:
Rodingites in the ultramafic rocks of the Abitibi belt, Ontario; Geol. Assoc. Can. – Mineral. Assoc. Can., Program with abstracts, vol. 8, p. A61, 1983.

The processes of serpentinization, chrysotile-asbestos vein development, rodingite development, and talc-carbonate alteration are being studied in the chrysotile-asbestos deposits of the Abitibi Belt of Ontario. The results produced will provide fundamental data useful to mineralogists and health and environmental scientists, but the main results will be an understanding of the process of Archean komatiite-ultramafic alteration and will provide a basis for comparison with Palaeozoic, ophiolite-hosted chrysotile-asbestos deposits which are the subject of a related study.

881. WICKS, F.J., SCHANDL, E.S., FALLS, R., Royal Ontario Mus. (Mineralogy and Geology):
Mineralogy and geochemistry of the chrysotile asbestos deposits of the Eastern Townships, Québec, 1982-85.

The processes of serpentinization, chrysotile-asbestos vein development, rodingite development, and talc-carbonate alteration are being studied in the chrysotile-asbestos deposits of the Eastern Townships of Québec. The results produced will provide fundamental data useful to mineralogists and health and environmental scientists, but the main results will be an understanding of the process of Palaeozoic ophiolite-ultramafic alteration, and will provide a basis for comparison with Archean, komatiite-hosted chrysotile-asbestos deposits which are the subject of a related study.

882. WONDERLEY, P., RIVERS, T., Memorial Univ. (Earth Sciences):
A metamorphic study of a portion of the Gander Zone, Newfoundland, 1981-85; Ph.D. thesis (Wonderley).

SEDIMENTARY/ROCHES SÉDIMENTAIRES

883. DANNER, W.R., NESTELL, M.K., SADA, K., Univ. British Columbia (Geological Sciences):
Regional study of the carbonate rocks and micropaleo. of Permian, Carboniferous, Devonian and Triassic sequences of southwestern British Columbia and northwestern Washington, 1957-.

A continuing project to relate the carbonate sequences to their plate tectonic and environmental origin. Studies have been and are being undertaken on Vancouver Island, San Juan Islands, Chilliwack Valley and adjacent areas, the Blind Creek and Shoemaker Creek limestones near Keremeos, British Columbia and other related limestones in Washington State, Oregon and northern California. For many of these areas it is hoped that detailed papers on their microplaeontology will eventually be presented along with their carbonate petrology and sedimentology.

884. IWUAGWU, J.C., LERBEKMO, J.F., Univ. Alberta (Geology):
Depositional and post-depositional analysis of the basal Belly River Formation in southwestern Alberta, 1979-83; Ph.D. thesis (Iwuagwu).

Detailed petrographic study of thin-sectioned samples is underway to characterize environments petrographically for adaptation to subsurface samples and will be completed summer 1983.

885. KENT, D.M., Univ. Regina (Geology):
The effects of diagenesis on the geometry of pore systems in hydrocarbon-bearing carbonate reservoir rocks in southeastern Saskatchewan, 1976-.

See:
Pore system and reservoir quality in Mississippian carbonates and their relationship to hydrocarbon reservoirs in southern Saskatchewan; North Dakota Geol. Soc. and Sask. Geol. Soc., Procs. 4th Internat. Williston Basin Symp., p. 191-201, 1982.

To continue the thrust of the present research by investigating new producing and stratigraphic intervals with one area of study the fields producing from the Ratcliffe Beds in south-central Saskatchewan. Some of the fields have high water production: to investigate the nature of the pore systems to understand the reason for variations in oil/water ratios.

886. MUGRIDGE, S., NOBLE, J.P.A., Univ. New Brunswick (Geology):
Carbonate diagenesis in the Silurian of northern New Brunswick/Gaspe, Québec, 1982-83; M.Sc. thesis (Mugridge).

To investigate the diagenetic history of the Silurian (Llandovery C_2 to Wenlock) of northern New Brunswick/Gaspé. Five field sections are included – East Port Daniel, Little Port Daniel River and Gascons (all Gaspé) and S.E. Upsalquitch River and Charlo River (New Brunswick). Techniques of study being utilized are standard petrographic analysis of thin sections, examination of stained acetate peels, energy dispersive X-ray for qualitative and semi-quantitative composition determination of carbonate cements, scanning electron microscopy and cathodoluminescene.

Briefly, the objectives of the thesis research are as follows: 1) observation and detailed description of diagenetic features observed; 2) reconstruction of the diagenetic sequence of events in each field area; 3) reconstruction of burial history for each area; and 4) comparison of burial histories.

887. SMITH, D.G.W., LERBEKMO, J.F., GLAZEBROOK, V., Univ. Alberta (Geology):
Applications of electron microprobe analysis to the characterisation of heavy mineral assemblages, 1983-.

Heavy mineral suites of arenaceous rocks have been studied for many years for the information that they can provide on provenance of sediments and the indications that they give on changes in paleogeography and drainage patterns.

These techniques have been limited, however, by the information that could be gleaned from examination of heavy mineral suites beneath the petrographic microscope. Recent developments in electron microprobe analysis, particularly the advances in quantitative energy dispersive techniques, offer the possibility of obtaining precise compositional information on the heavy minerals making up the suites, in reasonable periods of time. In addition to providing detailed information on the varieties of common heavy minerals such as garnets, tourmalines, amphiboles, etc., the technique offers the opportunity to investigate the so far unexplored potential of the opaque phases that are present.

These new possibilities ae being explored by investigating heavy mineral suites from sediments that straddle the Cretaceous/Tertiary boundary in Alberta. The suites have already been studied in some detail by conventional optical techniques. Thus they provide both an excellent vehicle for testing the potential of the microanalytical technique proposed and an opportunity to obtain more detailed information on the palaeogeographical changes that were taking place during the deposition of the sedimentary succession.

888. WILSON, J.A., Alberta Research Council (Geol. Surv.):
Athabasca Basin study, northeastern Alberta, 1979-.

In conjunction with the collection and preservation of mineral exploration core from the Basin, the stratigraphy, sedimentology, and post-depositional history of the rocks are being studied. Particular attention is being paid to the Athabasca Group and the underlying regolith.

GENERAL/GÉNÉRALITÉS

889. DRESSLER, B.O.B., Ontario Geol. Surv.:
The footwall and the sublayer of the Sudbury Igneous Complex, Ontario, 1979-83.

Field work and most laboratory research completed. Project is in the report writing stage. 1982 investigations were on the south range footwall rocks between Lockerby Mine and Falconbridge Mine.

890. HALL, J.M., ROBINSON, P.T., Dalhousie Univ. (Geology):
Cyprus crustal study project, 1981-87.

The Cyprus crustal study project is a seven country reexamination of the Troodos, Cyprus, ophiolite to elucidate ocean crust construction processes and to identify the origin of the type of ocean crust preserved in the opiolite. Both extensive field mapping and research drilling are used as tools.

To date, 3.2 km of drilling has been carried out. Three holes are in the extrusives, two in the stockwork beneath the Agrokipia ore

deposits. The fourth, 1.85 km hole extends from the base of the sheeted complex into cumulate ultramafics. The principal results to date are the clear identification of the primary geochemical nature of the extrusive section, new models for hydrothermal circulation and ore deposition as a normal process in ocean crust formation, and the nature of magma chambers in the plutonic complex.

891. HOUDE, R., BÉRARD, J., École Polytechnique (Génie minéral):
Etude des réactions chimiques entre un calcaire et le ciment Portland, 1981-83; thèse de maîtrise (Houde).

Determination des causes de l'expansion et de la désintégration des bétons faits avec un granulat calcaire dans la région de Trois-Rivières, Québec.

892. LAVERGNE, G., ROY, D.W., FRANCONI, A., Québec Ministère Énergie et Ressources:
Grenville 83, 1982-83; thèse de maîtrise (Lavergne).

893. WATKINSON, D.H., WILKINSON, S., JONES, P., Carleton Univ. (Geology):
Platinum-group elements in the Coldwell Complex, northwestern Ontario, 1981-83; M.Sc. thesis (Wilkinson).

Platinum-group elements occur with some magmatic sulfide concentrations in hybird gabbros near the contact of the Coldwell complex. High Pd/Pt and Cu/Ni ratios are typical. Sulfides were generated during assimilation of Archean greenstones and other siliceous rocks by Proterozoic gabbro intrusions.

894. YIN, H.A., GREENWOOD, H.J., Univ. British Columbia (Geological Sciences):
Stability of OH- and F-bearing tremolite, 1981-83.

Sees:
Determination of the equilibrium P-T curve of OH-tremolite; EOS Abstracts, May 1983.

The equilibrium OH-Tremolite = 3 Enstatite + 2 Diopside + Qtz + H_2O has been reversed, and found to pass through the points: 665° ± 10°C at 100 bars; 735° ± 10°C at 250 bars; 765° ± 10°C at 350 bars; 810° ± 10°C at 800 bars; 830° ± 10°C at 1400 bars. Linear programming analysis for thermodynamic consistency gives values for the whole reaction, of ΔH (298, 1 bar) = -118,332 (±5119)J and ΔS(298, 1 bar) = -168.849(±4.958)J/K. Experiments are in progress to evaluate the effect of substituting F for OH in the tremolite.

QUATERNARY GEOLOGY/GÉOLOGIE DU QUATERNAIRE

895. ALLEY, D.W., KUPSCH, W.O., CHRISTIANSEN, E.A., ACTON, D.F., LANGFORD, F.F., Univ. Saskatchewan (Geological Sciences):
Quaternary and older surficial geology of the Reindeer Lake South (64-D) map area, northeastern Saskatchewan, 1973-83; Ph.D. thesis (Alley).

896. ANDERSON, T.W., Geol. Surv. Can.:
Quaternary paleoecology, Great Lakes, 1978-.

897. ANDRIASHEK, L.D., Alberta Research Council (Geol. Surv.):
Quaternary stratigraphy and surficial geology of the Edmonton map area, NTS 83H, north-central Alberta, 1978-83.

Project at stage where all laboratory analyses are complete. Data will be compiled this year into a series of cross sections on a 1:125,000 scale.

898. ANDRIASHEK, L.D., FENTON, M.M., RUTTER, N.W., Alberta Research Council (Geol. Surv.), Univ. Alberta (Geology):
Quaternary stratigraphy of the Sand River map area (NTS73L), north-central Alberta, 1976-83; M.Sc. thesis (Andriashek).

Thesis is currently being written with expected completion April, 1983. Alberta Geological Survey report is in progress and should be completed by April 1983 as well. A bedrock topography map and surficial geology map are both in press.

899. BAKER, C.L., Ontario Geol. Surv.:
Sedimentology and provenance of sediments in eskers, Kirkland Lake area, Ontario, 1981-83.

Sees:
Report on the sedimentology and provenance of sediments in eskers in the Kirkland area, and finding of kimberlite float; Ontario Geol. Surv., Misc. Paper 106, 1982.

The fifth year of Quaternary studies centred on examining the stratigraphy and sedimentology of eskers in the Kirkland Lake region. The work located distinct sedimentary facies along the esker each with a unique stratigraphy. Sample taken in each of these facies were used to define a transport distance and provenance area for the sediments. The principal objective of the program was to develop methods by which glaciofluvial systems, particularly eskers, may be used as a prospecting tool.

During the course of field work two kimberlite boulders were found in a gravel pit in Gauthier Township. Following up a report of a prospector resulted in several large kimberlite boulders being discovered in Hearst Township near Larder Lake, Ontario.

900. BARNETT, P., Ontario Geol. Surv.:
Quaternary geology and stratigraphy of the Port Burwell – Long Point area, southwestern Ontario, 1982-84.

901. BATTERSON, M.J., VANDERVEER, D.G., ROBINSON, J., Newfoundland Dept. Environment, Dept. Mines and Energy:
Surficial geology of the Waterford River Basin, St. John's, Newfoundland, 1982.

Sees:
Current research; Newfoundland Mines and Energy, Rept. 82-1, 1982.

The Waterford river basin is situated in the path of the rapid urban expansion of Mount Pearl and St. John's, Newfoundland. The consequent modification of both the drainage pattern and water geochemistry has offered an opportunity to undertake a detailed examination of the effects of urban development on drainage basin hydrology.

The overburden in the Waterford River basin is generally thin (0-5 metres), and is composed of: (a) a very compact, poorly sorted lodgement till which has a high (10%) silt-clay content, and (b) a till deposit that is looser, coarser and therefore more permeable in nature, derived by supraglacial or melt-out processes. Water movement is largely determined by the overburden mantle and so the surficial geology is an important component of any hydrological study.

Hydrologically the most significant features of the surficial mantle is its thinness and the influence of bedrock over drainage, and the slow percolation and discharge of water through the hard lodgement till unit. Urban development effects discharge by reducing lag times for entry of water into the drainage system and consequently increases the potential for flooding and erosion, as well as altering water geochemistry. These effects will become progressively emphasized unless preventative measures are initiated.

902. BLAKE, W., Jr., Geol. Surv. Can.:
Quaternary geochronology, Arctic Islands, 1975-.

Sees:
Coring of frozen pond sediments, east-central Ellesmere Island: a progress report; Geol. Surv. Can., Paper 82-1C, p. 104-110, 1982.

903. BLASCO, S.M., Geol. Surv. Can.:
Surficial geology and geomorphology, Mackenzie Bay – continental shelf, 1970-.

904. BROOKES, I.A., SCOTT, D.B., McANDREWS, J.H., York Univ. (Geography):
Glacial and sea level history, Newfoundland, 1981-86.

Sees:
Quaternary interglacial and associated deposits in southwest Newfoundland; Can. J. Earth Sci., vol. 19, no. 3, p. 410-423, 1982.

905. CATTO, N.R., RUTTER, N.W., HUGHES, O.L., SCHWEGER, C.E., Univ. Alberta (Geology), Geol. Surv. Can.:
Quaternary geology of the Richardson Mountains region, Yukon-Northwest Territories, 1981-85; Ph.D. thesis (Catto).

Palynological analysis of sections along the Rat River have revealed a succession of environmental events representing a transition from a Pinus dominated boreal forest to an open tundra environment with scattered stands of Picea, and finally to an open tundra environment characterised by cold and dry conditions. This unit has been radiocarbon dated at <43,000 BP (GSC-3359). Palynological investigations have also been carried out on sediments obtained from a peat unit exposed southwest of Horn Lake, NWT. These samples show a gradual transition from a tundra environment with scattered wooded stands to a riverbank woodland. The base of this peat succession has been dated at 8280 ± 110 BP (GSC-3399).

Study of the lithology, mineralogy, texture, and sedimentology of the sediments collected in 1981 along the Rat and Peel Rviers, and in 1982 along the Peel, Snake, Caribou, and Rat Rivers is proceeding, as are additional palynological and paleoenvironmental investigations.

906. CHAUVIN, L., Québec Ministère Énergie et Ressources:
Géologie du Quaternaire de l'est de la Gaspésie, Québec, 1982-.

Voir:
Géologie du Quaternaire de la région de Mont-Louis – Grande-Vallée (comté de Gaspé-Est); Québec Ministère Énergie et Ressources, DP-82-04, 1982.

Etablir l'inventaire de la géologie du Quaternaire de la région. Etudier la dispersion glaciaire de la région et produire des documents de base pouvant aider à la prospection minière par les dépôts meubles.

907. CLAGUE, J.J., Geol. Surv. Can.:
Quaternary geology, terrain inventory, Prince Rupert-Terrace, Smithers area, British Columbia, 1975-.

908. CLAGUE, J.J., Geol. Surv. Can.:
Quaternary geology, upper Fraser River Basin, British Columbia, 1981-.

909. COAKLEY, J.P., KARROW, P.F., Univ. Waterloo (Earth Sciences), Environment Canada (National Water Res. Instit.):
Long-term evolution of the Lake Erie north shore based on the postglacial sedimentary record, 1980-83; Ph.D. thesis (Coakley).

910. COAKLEY, J.P., KARROW, P.F., Univ. Waterloo (Earth Sciences):
Late Quaternary history, Lake Erie spits, Ontario, 1981-83.

911. DREDGE, L.A., Geol. Surv. Can.:
Quaternary geology, terrain inventory, northeastern Manitoba, 1975-.

Seen:
Relict ice-scour marks and late phases of Lake Agassiz in northernmost Manitoba; Can. J. Earth Sci., vol. 19, no. 5, p. 1079-1087, 1982.

912. DREDGE, L.A., Geol. Surv. Can.:
Quaternary geology – terrain inventory, northwestern Manitoba, 1980-.

913. DUBOIS, J.M.M., GWYN, Q.H.J., Univ. Sherbrooke (Géographie):
Le Quaternaire d'Anticosti, Québec, 1979-84.

Voir:
Les séquences fluviale, marine et glaciomarine, centre de l'île d'Anticosti; Annales de l'ACFAS, vol. 49, p. 128, 1982.

Lithologie du till, île d'Anticosti; Annales de l'ACFAS, vol. 49, p. 128, 1982.

Les dépôts glacio-marines, île d'Anticosti; Annales de l'ACFAS, vol. 49, p. 137, 1982.

Les systèmes morainiques de la zone ouest de l'île d'Anticosti; Annales de l'ACFAS, vol. 49, p. 129, 1982.

Sédimentologie postglaciaire de la plate-forme émergée île d'Anticosti, Québec; 11e Congrès Int. de Sédimentologie, Hamilton, abstracts of papers, p. 139, 1982.

Evolution quaternaire de l'ouest de l'île d'Anticosti, golfe du Saint-Laurent, Québec; Réunion ann. de l'Ass. Can. Géogr., Ottawa, résumés, p. 93, 1982.

914. DYKE, A.S., Geol. Surv. Can.:
Quaternary geology – terrain inventory, Boothia Peninsula, northeast Keewatin, and Somerset and Prince of Wales Islands, District of Franklin, 1975-.

915. DYKE, A.S., Geol. Surv. Can.:
Quaternary geology-terrain inventory, Frances Lake, Yukon Territory, 1981-.

916. DYKE, A.S., Geol. Surv. Can.:
Quaternary geology-terrain inventory Prince of Wales Island, King William Island and adjacent mainland Keewatin, 1981-.

917. EDLUND, S.A., Geol. Surv. Can.:
Surficial geology-terrain inventory, Bathurst-Cornwallis and eastern Melville Islands, District of Franklin, 1976-.

918. ELSON, J.A., McGill Univ. (Geological Sciences):
Post-glacial uplift of Mont St. Hilaire, Quebec, 1981-84.

Seen:
Stop 3 – Mont St. Hilaire, southeast gravel pit; Guidebook 45th Ann. Meet. of the Friends of the Pleistocene, Drummondville-St. Hyacinthe, Quebec, Canada, Universite de Montréal, p. 29-32, 1982.

Strandlines concealed in the forest on the outer part of Mont St. Hilaire are being surveyed and are found to extend to higher altitudes than others in the region, and link to small deltas and river terraces in the drainage basin within the mountain to give a more complete record of the high water levels in the St. Lawrence lowlands than has hitherto been reported. Published radiocarbon dates provide a time framework for the uplift represented.

919. FARVOLDEN, R.N., KARROW, P.F., GREENHOUSE, J.P., Univ. Waterloo (Earth Sciences):
Subsurface stratigraphy and aquifer correlation of the Kitchener-Waterloo area, Ontario, 1982-83.

By means of geophysically logged rotary holes calibrated to a continuously-cored hole and river-bank exposures, it is planned to establish the age and correlation of the various aquifers of the Kitchener-Waterloo area in relation to the general Quaternary stratigraphy of the district.

920. FENTON, M.M., ANDRIASHEK, L.D., Alberta Research Council (Geol. Surv.):
Quaternary stratigraphy and surficial geology, Sand River map sheet, 1976-83.

All laboratory analyses completed. Surficial geology map and bedrock topography map completed with printing in early 1983. Stratigraphic synthesis nearing completion. Report about 50% complete, with submission to editing in mid 1983. New scientific findings include a number of previously unrecognized preglacial and interglacial units and the subdivision of previously recognized till units.

921. FENTON, M.M., MOUGEOT, C., Alberta Research Council (Geol. Surv.):
Quaternary stratigraphy and surficial geology of the Vermilion map sheet 73E, Alberta, 1978-84.

Field work is now complete except for checking a few problem areas. Laboratory analyses are 70% finished. Final airphoto interpretation and preparation of surficial geology map has begun and is approximately 10% completed. Scientific findings include the recognition of at least three texturally and lithologically distinct tills in the eastern half of the map area. These tills are tentatively correlated with glacial formations recognized in the eastern half of the Sand River map area.

922. FINAMORE, P., Ontario Geol. Surv.:
Quaternary geology of the Orillia-Fenelon Falls areas, southern Ontario, 1981-84.

923. FINAMORE, P.F., KARROW, P.F., Univ. Waterloo (Earth Sciences), Ontario Geol. Surv.:
Quaternary geology of the Fenelon Falls outlet of Lake Algonquin, Ontario, 1980-83; M.Sc. thesis (Finamore).

924. FITZGERALD, W., Ontario Geol. Surv.:
Quaternary geology of the Penetang Peninsula, central Ontario, 1982-83.

925. FORD, M.J., GEDDES, R.S., Ontario Geol. Surv.:
Quaternary geology of Algonquin Provincial Park, Algonquin Region, Ontario, 1982-83.

926. FRITZ, P., KARROW, P.F., MORGAN, A.V., EICHER, U., EDWARDS, T., Univ. Waterloo (Earth Sciences):
Postglacial changes in climate, 1979-86.

Molluscs and marl analyses were continued and a major new avenue was opened through ^{18}O and ^{2}H analyses in tree rings.

927. FULTON, R.J., Geol. Surv. Can.:
Quaternary geology inventory, southern Labrador, 1969-.

928. FULTON, R.J., Geol. Surv. Can.:
Quaternary geology of the Canadian Cordillera, 1975-.

929. FULTON, R.J., Geol. Surv. Can.:
Surficial geology, Cobden area (Quebec part), 1982-.

930. GABERT, G., ANDRIASHEK, L.D., Alberta Research Council (Geol. Surv.):
Hydrogeology of the oil sands, Cold Lake area project (HOSCLAP), north-central Alberta, 1982-84.

To assess the impact on the hydrogeology of the Cold Lake area by in situ heavy oil steam injection plants; specifically aimed at determining which aquifers may be impacted by steam injection wastes, and to determine the nature of flow from these oil recovery sites.

931. GADD, N.R., Geol. Surv. Can.:
Correlation of Quaternary geology; Great Lakes – St. Lawrence Valley region, 1978-.

932. GAUTHIER, R.C., Geol. Surv. Can.:
Géologie du Quaternaire région de Bathurst-Campbellton, Nouveau Brunswick, 1976-.

933. GODWIN, A., FRITZ, P., MORGAN, A.V., KARROW, P.F., Univ. Waterloo (Earth Sciences):
Stable isotope studies on Holocene freshwater molluscs, 1982-84; M.Sc. thesis (Godwin).

A series of 7 sites from Kincardine, Ontario are being investigated. These are river terrace deposits of Algonquin and Nipissing age. The molluscs within the terraces are being analysed for ^{18}O and ^{13}C stable isotopes. It is hoped to be able to interpret environmental conditions in the Kincardine area in early post glacial times.

Also, a series of growth experiments on molluscs will be carried out. Molluscs will be grown in pH controlled environments. The ^{13}C in their shells will be examined to test for possible discrimination against aqueous carbonate species in the dissolved inorganic carbon.

934. GRANT, D.R., Geol. Surv. Can.:
Surficial geology, St. Anthony-Blanc Sablon map-areas, Newfoundland, 1969-.

935. GRANT, D.R., Geol. Surv. Can.:
Surficial geology, Cape Breton Island, Nova Scotia, 1970-.

936. GRANT, D.R., Geol. Surv. Can.:
Surficial geology of Newfoundland, 1974-.

937. GRANT, D.R., Geol. Surv. Can.:
Quaternary stratigraphy Yarmouth region, Nova Scotia, 1979-.

938. GRAVENOR, C.P., Univ. Windsor (Geology):
Surface features on detrital garnets, 1978-86.

Seen:
Chattermarked garnets in Pleistocene glacial sediments; Geol. Soc. Amer. Bull., vol. 93, p. 731-738, 1982.

Chattermark trails found on garnets have been used as evidence to demonstrate that certain ancient diamictites have a glacial origin. Additionally, the percentage of grains which have chattermarks has been used along with other evidence to determine the nature of ancient glaciations. More recently, chattermarked garnets from a variety of Pleistocene glacial environments have been examined. The results show that the percentage of garnets with chattermark trails shows local variations but if a sufficient number of samples are examined, there is a crude correlation between the percentage of chattermarked garnets and the distance over which the garnets have been glacially transported.

Garnets from other non-glacial environments are now being studied in detail to make sure that chattermarks can be used as a one step indicator of glacial transport.

939. GWYN, Q.H.J., BROOKFIELD, M.E., MARTINI, I.P., LESSARD, G., Univ. Sherbrooke (Géographie), Univ. Guelph (Land Resource Science):
Lithologie, stratigraphie et étude géotechnique des dépôts quaternaires dans le sud du Québec et de l'Ontario, 1978-84.

Voir:
Quaternary sequences along the north shore of lake Ontario: Oshawa-Port Hope; Can. J. Earth Sci., vol. 17, no. 9, p. 1836-1850, 1982.

Nouvelle courbe d'émersion des terres pour le bassin ouest de la mer de Champlain; Annales de l'ACFAS, vol. 49, p. 130, 1982.

Corrélations lithologiques, stratigraphiques et chronologiques des dépôts quaternaires entre le sud de l'Ontario et le Québec. Aspects géotechniques de ces dépôts.

940. GWYN, Q.H.J., DUBOIS, J.M.M., POULIN, A., CLÉMENT, P., Univ. Sherbrooke (Géographie):
Le Quaternaire des Cantons de l'Est, Québec, 1980-86.

Voir:
Cartes géomorphologiques des Cantons de l'Est: régions de Dudswell, Scotstown, Sherbrooke, La Patrie, Coaticook et Malvina; Dépt. de géogr., Univ. de Sherbrooke, Bull. rech. no. 61, 1982.

Importance du site dans la genèse des minéraux secondaires issus des altérations superficielles. Exemple des granites et des gabbros du Mont Mégantic, Québec, Canada; Catena, vol. 9, nos. 3-4, p. 181-198, 1982.

L'utilisation de l'outil informatisé dans le but de déterminer la (les) directions d'écoulement glaciaire dans la région du lac Memphrémagog; Annales de l'ACFAS, vol. 49, p. 129, 1982.

La déglaciation de la haute vallée de la rivière St-François, sud du Québec; Réunion annuelle de l'Ass. Can. Géogr., Ottawa, résumés, p. 75, 1982.

Modèle de déglaciation de la vallée de la rivière au Saumon, Cantons de l'Est, Québec; Annales de l'ACFAS, vol. 49, p. 129, 1982.

941. HICOCK, S.R., Univ. Western Ontario (Geology):
Quaternary stratigraphy and glacial geology of southwest British Columbia, 1974-.

Sees:
Late Pleistocene proboscideans and early Fraser glacial sedimentation in eastern Fraser Lowland, British Columbia; Can. J. Earth Sci., vol. 19, p. 899-906, 1982.

Lag of the Fraser glacial maximum in the Pacific Northwest: pollen and macrofossil evidence from western Fraser Lowland, British Columbia; ibid., p. 2288-2296, 1982.

A general stratigraphic scheme has been developed for mid to late Pleistocene sediments in the Georgia Depression of southwest British Columbia. Detailed palynological, amino acid, paleomagnetic, and thermoluminescence analyses are being undertaken for finer stratigraphic correlation within the basin. A general glacial flow model has been developed for the area and till genesis studies at specific sites are still in progress. The ultimate aim is to achieve detailed correlations within and beyond the basin, and to refine glacial history and ice movements in order to apply the information to mineral exploration.

942. HICOCK, S.R., DREIMANIS, A., Univ. Western Ontario (Geology):
Canadian glacitectonic structures and their usefulness, 1982-.

Detailed structural data has been collected from Pleistocene exposures in the north shore of Lake Erie, Toronto, and southwest British Columbia. Further data will be gathered from other sites to study the relationship between glacially-induced structures, ice movement directions, and subglacial dynamics. Information on Cenozoic crustal movements will have bearing on nuclear waste disposal considerations, gleaned from some of the non-glacially induced structures in Quaternary sediments.

943. HODGSON, D.A. Geol. Surv. Can.:
Surficial geology and geomorphology of central Ellesmere Island, District of Franklin, 1972-.

944. HODGSON, D.A., Geol. Surv. Can.:
Surficial geology, geomorphology and terrain inventory of the Ringnes and adjacent islands, District of Franklin, 1976-.

945. HUGHES, O.L., Geol. Surv. Can.:
Quaternary stratigraphy of Old Crow Basin and Porcupine River Valleys, Yukon, 1968-.

946. HUGHES, O.L., Geol. Surv. Can.:
Quaternary geology, Mayo-McQuesten, Yukon Territory, 1979-.

947. JACKSON, L.E., Jr., Geol. Surv. Can.:
Quaternary geology, terrain inventory, Kananaskis Lakes, Alberta, 1974-.

Sees:
Paraglacial origin for terraced river sediments in Bow Valley, Alberta; Can. J. Earth Sci., vol. 19, no. 12, p. 2219-2231, 1982.

948. JACKSON, L.E., Jr., Geol. Surv. Can.:
Quaternary geology and terrain inventory, Nahanni – Sheldon Lake – Finlayson Lake, Yukon and District of Mackenzie, 1980-.

949. KARROW, P.F., Ontario Geol. Surv.:
Quaternary geology, St. Josephs Island, Ontario, 1982-83.

Sees:
Ontario Geol. Surv., Prel. Map P-2581, 1982.

Mapping of the glacial and glaciolaustrine deposits was carried out on 1:50,000 base maps. During ice retreat most of the present island was submerged by Lake Algonquin, reworking the till into extensive gravel terraces and bars.

950. KARROW, P.F., MILLER, B.B., Univ. Waterloo (Earth Sciences), Kent State Univ. (Geology):
Great Lakes history, glacial lake shorelines, fossils and chronology, 1968-.

Sees:
Algonquin-Nipissing glacial lake shorelines, St. Joseph Island, Ontario; Geol. Soc. Amer., Abstracts with programs, vol. 14, p. 264, 1982.

Valley terraces and Algonquin shoreline position, southeast shore of Lake Huron, Canada; 25th Conf. on Great Lakes Res. (abstract), p. 34, 1982.

Analysis of molluscan faunas from numerous valley terrace and beach sites in the southern Huron basin is being supplemented by additional sites farther north.

951. KARROW, P.F., MORGAN, A.V., HANN, B.J., KALAS, L.L., KERR-LAWSON, L., Univ. Waterloo (Earth Sciences):
Paleontology of the Toronto Interglacial, Ontario, 1963-; M.Sc. thesis (Kerr-Lawson).

Manuscript on Cladocera in preparation (Hann). Bulk samples of Don Formation being studied for vertebrate remains (chiefly fish) and isotopic analysis of mollusc shells. Examination of molluscan fauna from Woodbridge in progress.

952. KARROW, P.F., WARNER, B.G., Univ. Waterloo (Earth Sciences), Simon Fraser Univ. (Biology):
Stratigraphy and palynology of the Waterloo interstadial site, Ontario, 1980-83.

Sees:
Buried interstadial organic site at Waterloo Ontario; Geol. Assoc. Can. – Mineral. Assoc. Can., Program with abstracts, vol. 7, p. 59, 1982.

Buried organic sediments contain mollusc and insect fragments, as well as ostracodes, plant macrofossils, and pollen. Overlying Tavistock, Maryhill, and Catfish Creek drift and an accelerator radiocarbon date on wood fragments indicate a Middle Wisconsinan age. Manuscript is nearing completion.

953. KLASSEN, R.A., Geol. Surv. Can.:
Quaternary geology inventory, lower Nelson River basin, Manitoba, 1971-.

954. KLASSEN, R.A., Geol. Surv. Can.:
Surficial geology and Quaternary stratigraphy of north Baffin-Bylot Islands, District of Franklin, 1978-.

955. KLASSEN, R.A., Geol. Surv. Can.:
Drift prospecting, east-central Labrador, 1982-.

Sees:
A preliminary report on drift prospecting studies in Labrador; Geol. Surv. Can., Paper 83-1A, p. 353-355, 1983.

956. KUPSCH, W.O., WILSON, J.S., Univ. Saskatchewan (Geological Sciences):
Boulder tracing and glacial geology in the Cluff Lake area, northern Saskatchewan, 1981-84; M.Sc. thesis (Wilson).

The Cluff lake area has undergone a complex glacial history with at least two episodes of glaciation – first interpret the glacial history and second to investigate the mineralized boulder trains of the area. Mineralized boulders (up to 25% U_3O_8) define a broad, irregular train, not aligned in the regional glacial direction. The boulder field is not associated with any geochemical at radiometric anomalies.

957. LaSALLE, P., Québec Ministère Énergie et Ressources:
Géologie du Quaternaire - Région de New-Richmond – Bonaventure, Gaspésie, Québec, 1983-.

Etudes des sédiments quaternaires: géochimie de prospection, sédimentologie, génèse des dépôts, histoire glaciaire.

958. LAURIOL, B., GWYN, Q.H.J., BONN, F., HÉTU, B., Univ. Sherbrooke (Géographie):
Hydrogéologie et hydrogéomorphologie de la dissolution des roches carbonatées au nord du golfe du Saint-Laurent, Québec, 1981-86.

Voir:
Reconnaissance des formes karstiques à Anticosti, Québec; Annales de l'ACFAS, vol. 49, p. 133, 1982.

959. LEVSON, V.M., RUTTER, N.W., Univ. Alberta (Geology):
Pleistocene glaciations in Jasper National Park, Alberta, Canada, 1982-84; M.Sc. thesis (Levson).

A preliminary investigation of the Quaternary stratigraphy was carried out in the summer of 1982, in the Jasper National Park region. This work included mapping the surficial geology from aerial photographs and describing geological sections in the field. Similar research will be conducted in the summer of 1983 with the intent of correlating glacial events in the Jasper region with those in previously studied areas of the Canadian Rocky Mountains.

960. LEYLAND, J., Ontario Geol. Surv.:
Quaternary geology of the Sydenham-Bath map areas, Eastern Ontario, 1982-84.

961. MARTINEAU, G., BOUCHARD, M., PRICHONNET, G., Québec Ministère Énergie et Ressources:
Géologie du Quaternaire – Région de Chibougamau, Québec, 1982-85.

Légende de terrain mise au point; 2 cantons de cartographie; données relatives au mouvement glaciaire compilées et analysées; échantillons en cours d'analyses.

962. MILLER, R.F., MORGAN, A., FRITZ, P., Univ. Waterloo (Earth Sciences):
Stable isotopes of carbon and hydrogen in the exoskeleton of insects: developing a tool for paleoclimatic research, 1980-84; Ph.D. thesis (Miller).

Fossil beetle assemblages have been used for many years as indicators of paleoecology and paleoclimatic conditions. Apparently unaltered fossils corresponding with modern beetle species are known from late Tertiary time and the Quaternary and Holocene. The stable isotope composition of hydrogen and carbon in the insolubel "chitin" fraction of insect exoskeleton is being analyzed to see whether it can be used as a paleoclimatic tool. The exoskeleton, composed primarily of a chitin-protein complex is well preserved in fossils, particularly in Coleoptera, since many beetles possess heavily sclerotised heads, thoracic segments and elytra.

Carbon isotopes are being used to study the relationship of chitin isotope content to diet and isopic variation during chitin formation to try to understand how the ratio relates to diet. The hydrogen isotope composition of chitin from beetles collected from across North America is being analysed and compared to hydrogen isotope ratios of meteoric water to look for a correlation between the D/H ratio of chitin and climate.

The technique will be applied to samples of fossil material from Quaternary deposits in North America.

963. MILLS, A.J., BROOKES, I.A., RITCHIE, J.C., CHURCHER, C.S., McDONALD, M.M.A., Royal Ontario Mus. (Egyptian):
Archeological survey of Dakhlel Oasis, Egypt, 1978-83.

964. MORGAN, A.V., MORGAN, A., Univ. Waterloo (Earth Sciences):
Analysis of late Pleistocene climatic fluctuations and zoogeographic shifts in the Canadian insect fauna, 1977-.

See:
A post-glacial coleopterous assemblage from Lockport Gulf, New York; Quat. Res., vol. 17, p. 258-278, 1982.

Distribution and probable age of relict permafrost features in southwestern Ontario; Proc. Fourth Can. Permafroet Conf., p. 91-100, 1982.

To trace rates of insect faunal changes, to compare these with floral changes, and eventually to establish a model of climatic change.

The greatest effort has been to describe Late Glacial and Holocene sites from southern Ontario and the northeastern United States. Further "time blocks" which are emerging for distinct studies are: 1) Sangamon environments; 2) Early and Middle Wisconsin faunas, primarily from Southern Ontario and adjacent New York; 3) comparison of Nipissing sites in the Great Lakes Basin; and 4) preliminary investigations of archaeological sites in Newfoundland and southern Ontario.

Geochemical studies are being made of various biochemical fractions of insects (mainly beetles) to determine if we can obtain paleoenvironmental data from the analysis of hydrogen and carbon isotope ratios in the fossil fragments. Also post-mortal processes are being investigated to explain some of the apparent anomalies (i.e. differential preservation) we are finding in fossil assemblages.

965. MOTZ, J., MORGAN, A.V., MORGAN, A., Univ. Waterloo (Earth Sciences):
Paleoentomological analysis of a late-glacial site near Brampton, Ontario, 1982-84; M.Sc. thesis (Motz).

See:
Fossil insect assemblages from the base of a late-glacial sequence near Brampton, Ontario; Geol. Assoc. Can. – Mineral. Assoc. Can., Program with abstracts, vol. 7, p. 67, 1982.

To elucidate the transition from open ground to a forested environment in western Ontario, following the retreat of the Port Huron Ice Sheet. To this end, a paleo-entomological analysis of a glacial kettle in the Brampton esker, near Brampton, Ontario, has been undertaken. Sedimentation in this kettle commenced soon after ice retreat, at approximately 13,000 years BP, and continued until at least 7,000 yr. B.P. This site will, hopefully, provide a continuous environmental record of the area from the time immediately after deglaciation, through the various stages of reforestation.

966. MUDIE, P.J., Geol. Surv. Can.:
Quantitative Quaternary paleoceology, Eastern Canada, 1982-.

See:
Ecostratigraphic and paleomagnetic studies of Late Quaternary sediments on the north-east Newfoundland Shelf; Geol. Surv. Can., Paper 82-1B, p. 107-116, 1982.

967. PELLETIER, B.R., Geol. Surv. Can.:
Quaternary paleo-sealevel map of Canada, 1978-.

968. PETRYK, A.A., Québec Ministère Énergie et Ressources:
Reconnaissance of the Quaternary geology of Anticosti Island, Québec, 1976-85.

Considerable new information on the Quaternary geology and specifically on the Wisconsinan glaciation of Anticosti Island was logged during field mapping and stratigraphic studies of the Anticosti platform sequence, dating from 1975. Compilation and synthesis of the data began in early 1983. Evidence shows that Anticosti Island was overrun by Wisconsinan ice.

969. PILNY, J.J., MORGAN, A.V., MORGAN, A., Univ. Waterloo (Earth Sciences):
Paleoentomological analysis of several Quaternary sites, 1982-84; M.Sc. thesis (Pilny).

Two sites are currently being studied for their fossil insect faunas. One site is near Rostock, Ontario, where mammoth bones have been recovered. The material so far analysed is rich in insects, as well as molluscs, and is post-glacial in age (11-9,000 Y.B.P.). The second site is a steep bank of a stream near Innerkip, Ontario. The organic horizon is of interstadial age (50-100,000 Y.B.P.).

970. RICHARD, J.A., Ontario Geol. Surv.:
Quaternary geology of the Kamiskotia-Palmour map areas, Timmins, Ontario, 1982-84.

971. RICHARD, J.A., KARROW, P.F., Univ. Waterloo (Earth Sciences), Ontario Geol. Surv.:
Glacial history of the Cochrane advance, northern Ontario, 1981-83; M.Sc. thesis (Richard).

972. RICHARD, S.H., Geol. Surv. Can.:
Surficial geology, Tawatinawa area, Alberta, 1968-.

973. RICHARD, S.H., Geol. Surv. Can.:
Surficial geology, Ottawa Valley lowlands, Ontario-Québec, 1976-.

See:
Late glacial and postglacial macrofossils from the Ottawa-St. Lawrence Lowlands, Ontario and Quebec; Geol. Surv. Can., Ppaer 83-1A, p. 371-379, 1983.

974. RUTTER, N.W., Univ. Alberta (Geology):
Quaternary history of parts of Alberta, British Columbia, 1976-.

975. RUTTER, N.W., CRAWFORD, R.J., Univ. Alberta (Geology):
Development of amino acid racemization dating techniques, 1976-.

976. SADO, E.V., Ontario Geol. Surv.:
Synoptic Quaternary geology mapping of southwestern Ontario, 1982-85.

977. ST-ONGE, D.A., BRUNEAU, H.C., Univ. Ottawa (Géographie):
L'étude géomorphologique et stratigraphique du secteur aval de la rivière Coppermine, T.N.O., 1981-83; thèse de maîtrise (Bruneau).

L'étude géomorphologique et stratigraphique du secteur aval de la rivière Coppermine a permis de retracer l'évolution géomorphologique de cette région. Ainsi, une série de deltas dont l'apex se situe à 170 m a.n.m. a pu être observée. Une carte des dépôts meubles au 1:100,000 a déjà été réalisée. La rédaction de la thèse se poursuit.

978. ST-ONGE, D.A., BRUNEAU, H.C., MERCIER, A.L., Univ. Ottawa (Géographie), Indian and Northen Affairs Canada:
Geomorphologie et stratigraphie du secteur aval de la riviére Coppermine T.N-O; Postglaciaire du bassin de la riviere Richardson T.N-O, 1981-84.

Voir:
Quaternary geology of upper Coppermine River Valley, District of Mackenzie; Geol. Surv. Can., Paper 82-1A, p. 127-129, 1982.

Les formes d'effondrement et le mode de déglaciation de la région du lac Qingaluk, Territoires de Nord-Quest; Revue de Géographie physique et Quaternaire, vol. XXXVI, nos. 1-2, p. 233-240, 1982.

A variety of forms and deposits have been used to determine ice frontal positions during retreat of the last ice sheet from the Coppermine River basin. Except for the Forcier Lake and Dismal Lakes moraines, ice fronts were determined by inferences. The two main ones being positions the glacier ice must have occupied in order (1) to pond glacial lake waters at a given altitude and, (2) to feed meltwater streams cutting gorges in bedrock and/or constructing large deltas in Glacial Lake Coppermine.

The deglaciation model presented here requires that a westerly advancing ice lobe blocked the lower reaches of the Richardson and Rae Rivers. Ice flow indicators mapped by Craig (1960) show that east of the Coppermine River Valley the trend of ice movement is north-northwest and that it became west-northwest to the west of the river. The more westerly compoent found here is a late phenomenon, whereas the generally north-northwest flow represents movement during ice maximum (Craig, 1960; Prest, 1969). This pattern agrees with the recently proposed concept of the M'Clintock Ice Dome (Dyke et al., 1982).

So far radiometric dating only provides minimum ages for the deglaciation of the region, and only shows that the ice fronts defined are more than 10 200 BP. If Glacial Lake Coppermine lasted for a minimum of 450 years, as suggested by St-Onge et al. (1981), this pushes the minimum age of deglaciation back to 19 650 BP. It is therefore reasonable to suggest that the Forcier Lake moraine was constructed at least 11 500 years B.P.

Preliminary work in the Richardson River basin suggests that a glacial lake may have occupied this region prior to the disappearance of glacier ice from the lower Coppermine River valley.

979. ST-ONGE, D.A., MERCIER, A.L., Univ. Ottawa (Géographie):
Post-glaciaire du bassin de la rivière Richardson, T.N.-O, 1981-84; thèse de maîtrise (Mercier).

See:
Models: an approach to regional studies, the Richardson River basin, N.W.T.; Geoscope, vol. 13, no. 2, p. 55-66, 1983.

Systematic mapping of surficial deposits in the Point Lake, Red Rock Lake, Rocknest Lake shows that during the Kamut Lake outlet phase the upper reaches of Glacial Lake Coppermine were occupied by extensive masses of dead ice. The deglaciation of the region can be divided into 4 principal phases all of which predate 10,000 BP. Preliminary work in the Richardson River basin suggests that a glacial lake may have occupied this region prior to the disappearance of glacier ice from the lower Coppermine River valley.

980. SCHREINER, B.T., Univ. Saskatchewan (Geological Sciences):
Pleistocene stratigraphy in relation to groundwater aquifers and other resources in the Melville area, Saskatchewan, 1981-84; Ph.D. thesis.

See:
Hatfield Valley aquifer system in the Melville region; Sask. Res. Council, Publ. G-743-3-B-82, 1982.

All field work involving test drilling and sampling has been completed. Some augering to determine shallow stratigraphy will be done next summer. Preliminary cross sections and maps have been prepared. This information will be refined, expanded and updated in the future.

981. SHETSEN, I., Alberta Research Council (Geol. Surv.):
Quaternary geology map of southern Alberta, 1978-86.

See:
Ice lobes of the last continental glacier in southern Alberta (abstract); Geol. Assoc. Can. – Mineral. Assoc. Can., Program with abstracts, vol. 7, p. 81, 1982.

Field study has been completed for the southern portion of the area (south of 52°). Quaternary geology maps on a scale of 1:250,000 have been compiled for NTS sheets 72E, 72L, 72M, and 82P. The final map of the area south of 52° is in preparation. In 1983, field work will be extended to the area north of 52°.

982. SHILTS, W.W., Geol. Surv. Can.:
Properties and provenance of till, 1969-.

983. SHILTS, W.W., Geol. Surv. Can.:
Quaternary geology inventory – southern Keewatin, 1973-.

984. SHILTS, W.W., Geol. Surv. Can.:
Glacial erosion of the Canadian Shield, 1978-.

985. SIMPSON, M.A., SCHREINER, B.T., Saskatchewan Research Council (Geology):
Aggregate inventory of Saskatchewan, 1981-.

The inventory will take the form of a series of 1:50,000 scale, monochrome maps. Information regarding aerial extent, estimated reserves, and quality of aggregate material at each deposit will be indicated on the maps. A computerized file of specific aggregate information, obtained during the study, will also be available. Four map areas 73 B/1, 73 B/2, 73 B/7 and 73 B/8 are currently under investigation.

986. SMALLEY, I.J., Univ. Waterloo (Earth Sciences):
Sources and distribution of loess in North America, 1983-.

To develop a new approach to loess in North America: major sources will be identified and significant events in the loess formation sequence will be investigated, with special attention to loess sources in Canada and the smaller scale systems in the United States south-west, and the Washington State region.

987. SPARKES, B.G., VANDERVEER, D.G., Newfoundland Dept. Mines and Energy:
Surficial and glacial mapping on the central Volcanic Belt, central Newfoundland, 1978-.

In 1982, surficial mapping was continued in the Buchans map area (12 A/15). Approximately 250 till samples were obtained from 200 sites. Of these sites, forty were backhoe dug trenches where the till was profile sampled and till fabrics were obtained. A lithological analysis of the till was done in field, and partice size analysis and geochemistry were done at the lab.

Glacial features in the Buchans area, indicate three distinct directions of glacial flow. An early flow to the south crossed at least the western half of the map area and its evidence is seen in faint striae in several locations. Subsequent to this flow, (after a partially ice free period) ice advance was towards the northeast, from a center to the west of the town of Buchans.

The latest ice flow over the area was towards the southwest and possibly only affected the western half of the map area.

988. STALKER, A.MacS., Geol. Surv. Can.:
Quaternary of southern Alberta, 1965-.

See:
Borehole and outcrop stratigraphy compared with illustrations from the Medicine Hate area of Alberta; Geol. Surv. Can., Bull. 296, 1983.

989. STEA, R.R., ROGERS, P.J., Nova Scotia Dept. Mines and Energy:
Quaternary geology and till geochemistry, northern Nova Scotia, 1982-83.

See:
Surficial geology of the western part of Cumberland County, Nova Scotia; Geol. Surv. Can., Paper 83-1A, p. 197-202, 1983.

Plan to complete 4 colour maps and report on northern Nova Scotia Quaternary geology, in addition to 4 black and white till geochemistry maps all at a size of 1:100,000.

990. TELLER, J.T., Univ. Manitoba (Earth Sciences):
Lake Agassiz-Lake Superior connection, 1980-.

The channels that carried overflow from Lake Agassiz to Lake Superior via the Nipigon basin have been identified, mapped, measured, and described. In all, 17 major eastern outlets to Lake Agassiz exist, each used in series from south to north as the Laurentide ice sheet retreated. The initial discharge through each channel was catastrophic, typically exceeding 100000 m^3/sec. and causing a bedload of boulder, cobbles, and coarse gravel to be transported and deposited. Lake Agassiz levels fell abrupty each time a new outlet was uncovered, and thousands of cubic kilometres of water flowed into the Great Lakes in a period of only a year or two. The most recent period of use of these channels occurred during the Nipigon Phase of Lake Agassiz, between about 9500 B.P. and 8500 B.P. The results of this study to date have been published and a thesis is also being prepared.

991. VINCENT, J-S., Geol. Surv. Can.:
Surficial geology inventory, Banks Island, District of Franklin, 1976-.

992. VINCENT, J-S., Geol. Surv. Can.:
Surficial geology inventory, western Victoria Island, District of Franklin, 1981-.

993. WATTS, S.H., Sir Sandford Fleming College (Geology):
Bedrock weathering processes and products under arid arctic conditions, 1979-83.

See:
Weathering pit formation in bedrock near Cory Glacier, southeastern Ellesmere Island, District of Franklin; Geol. Surv. Can., Paper 83-1A, p. 487-491, 1983.

During the 1982 field season studies were concluded at the Cory Glacier site on southeastern Ellesmere Island. Using ongoing experiments set up in 1981, observations were made on the accumulation of salts derived from aerosols, on bedrock surface disintegration processes and on debris removal by snowmelt and solifluction. Rock specimens were collected for subsequent scanning electron microscope studies presently in progress. On the basis of field data on highly weathered terrain studied on western Somerset Island, and in the Cape Herschel-Alexandra Fiord areas of east-central Ellesmere Island along with information compiled at the Cory Glacier site, the following observations may be noteworthy.

1) Similar yet not identical assemblages of weathering forms occur at or near sealevel and in upland summit areas at widely scattered localities in the Precambrian Shield of high Arctic Canada.

2) Lithology and, more specifically, mineral composition, texture and rock structure markedly influence the degree of development of these weathering forms.

3) Water plays a major role in the physical disintegration processes. There is good evidence (presently being analytically confirmed) that salt precipitation along coastal areas both at sealevel and on summit plateaus may influence the microfracturing process believed to be often responsible.

4) Backwearing through microfracturing of joint block surfaces and subsequent removal of debris particularly through solifluction continue to further the process of tor formation. Thus local topographic relief also influences weathering form production and preservation.

5) In the absence of well defined moraine sequences the actual age of these features is extremely difficult to ascertain. Moreover, visual impressions are confused by what appears to be relatively intense modern weathering.

6) Nevertheless, the presence of erratics resting on these forms suggests that the upland features may predate at least one glaciation.

7) Terrain described in this study lies immediately adjacent to upland ice caps and the assumption that tors, etc. in themselves define ice-free areas is not valid. Preservation of these features without destruction either by actively eroding ice or by continental subaerial disintegration could be attributed to lengthy preservation beneath cold-based ice. Subaerial weathering would cease at such time.

8) Degree of weathering is, at best, of only secondary value in chronology studies in high Arctic Canada.

A final report on this project will be submitted on completion of laboratory studies currently underway.

994. AMOS, C.L., Geol. Surv. Can.:
Landsat calibration for suspended sediment concentration in marine coastal environments, 1978-.

995. BÉLANGER, J.R., Geol. Surv. Can.:
Remote sensing applied to Quaternary geology and mineral tracing, 1978-.

See:
Surficial geology mapping using remote sensing; Geol. Surv. Can., Paper 83-1A, p. 465-468, 1983.

996. BONN, F., BERNIER, M., BROCHU, R., Univ. Sherbrooke (Géographie):
Utilisation des données du satellite H.C.M.M. et du concept d'inertie thermique en télédétection du milieu naturel, 1978-83.

Voir:
Une première interprétation des images H.C.M.M. du sud du Québec et de l'Ontario; in: F. Bonn (ed.), Télédétection et gestion des ressources, A.Q.T., vol. 3, p. 101-112, 1982.

Le but de ce projet est d'essayer de faire une corrélation entre l'inertie thermique apparente d'un sol et sa teneur en eau. A date, on a trouvé que la résolution était ce qui avait de plus important car avec une résolution de 120 m, c'est le contenu en eau des plantes qui influence le plus l'inertie thermique alors qu'avec une résolution de 4 m la relation avec le contenu en eau du sol est meilleur.

997. BONN, F., DUBOIS, J.M.M., EL-SABH, M., Univ. Sherbrooke (Géographie):
Etude de la dynamique de l'estuaire du Saint-Laurent par thermographie aérienne et spatiale, 1982-84.

Détermination de la dynamique multitemporelle des courants marins par imagerie des satellites NORA et H.C.M.M.

998. BONN, F., GWYN, Q.H.J., DUBOIS, J.M.M., Univ. Sherbrooke (Géographie):
Utilisation des techniques de télédétection dans l'étude des dépôts meubles et des ressources en eau dans les Appalaches et les Bassess-Terres du Saint-Laurent, 1980-83.

Voir:
Télédétection et gestion des ressources; Ass. Qué. de télédétection, vol. 3, 1982.

999. BONN, F., GWYN, Q.H.J., DUBOIS, J.M.M., Univ. Sherbrooke (Géographie):
Utilisation des images radar pour les études gémorphologiques et des dépôts meubles, 1982-86.

Voir:
Aperçu gémorphologique de l'utilisation des images radars dans l'interprétation des formes et des dépôts des Cantons de l'Est, Québec; Annales de l'ACFAS, vol. 49, p. 127, 1982.

Optimisation de l'utilisation du radar par l'élaboration de clefs d'interprétation.

1000. BONN, F., GWYN, Q.H.J., DUBOIS, J.M.M., CASTONGUAY, J., BOISVERT, J.J., LAURIOL, B., Univ. Sherbrooke (Géographie):
Télédétection et cartographie des processus côtiers et tendances multi-scalaires d'évolution littorale dans le golfe du Saint-Laurent, 1980-86.

Voir:
Un project à long terme d'étude des tendances multiscalaires d'évolution littorale dans le golfe du Saint-Laurent: premiers résultats; Commission de l'environnement côtier, Union géographique internationale, Conférence de Rio-de-Janeiro, 1982.

Projet d'évolution des littoraux du golfe du Saint-Laurent: les tempêtes et l'érosion des côtes; Réunion ann. de l'Ass. can. Géogr., Ottawa, résumés, p. 137, 1982.

Essai d'analyse des tempêtes dans le golfe du Saint-Laurent, décennie 1960-69; Annales de l'ACFAS, vol. 49, p. 132, 1982.

1001. BONN, F., PESANT, A., BROCHU, R., Univ. Sherbrooke (Géographie):
Evaluation des possibilités des nouvelles bandes spectrales du capteur THEMATIC MAPPER dans le domaine agraire par simulation aéroportée de Landsat-D, 1982-84.

Voir:
Une étude comparative de simulations SPOT et LANDSAT-D dans un milieu agricole et périurbain du sud du Québec; in G. Rochon et A. Chabreuil (eds.), Le système SPOT d'observation de la terre, A.Q.T., p. 111-123, 1982.

Evaluation des possibilités de SPOT et de LANDSAT-D en agriculture.

1002. BONN, F., THOMPSON, D., Univ. Sherbrooke (Géographie):
L'utilisation de Landsat dans la surveillance du développement des ressources au Canada, 1982.

Evaluer l'utilisation de Landsat dans la surveillance du développement des ressources au Canada.

1003. CLOUGH, D., BONN, F., Univ. Sherbrooke (Géographie), Systems Engineering Ass.:
Radarsat land benefit study, 1982.

1004. DUBOIS, J.M.M., Univ. Sherbrooke (Géographie):
Hydromorphologie des rivières saumon au Québec, 1975-83.

Voir:
Géomorphologie, télédétection et potentiel d'acceuil salmonicole des rivières du Québec; in Coastal Studies in Canadian Geography No. 1, Saint Mary's Univ., Halifax, p. 89-109, 1982.

Potentiel use of vertical panchromatic air photographs in salmon habitat surveys and small production estimates; Joint Ann. Mtg. Can. Conf. for Fresh Water and Fish. Res., Ottawa, 1982.

Rivière Eternité: adaptation d'une méthode d'inventaire biophysique des cours d'eau; Annales de l'ACFAS, vol. 49, p. 127, 1982.

Les buts étaient de montrer l'utilité de la géomorphologie et les possibilités de la photo-interprétation dans les inventaires de l'habitat du saumon pour en dériver des potentiels; ce qui a été démontré avec des degrés de confiance variant généralement entre 75 et 85% par rapport aux données de terrain.

1005. ESTES, J.E., BONN, F., EZRA, E., Univ. California, Univ. Sherbrooke (Géographie):
Thermal infrared remote sensing for detection of agricultural drainage problems in arid environment, 1980-84.

See:
The feasibility of thermal inertia mapping for detection of perched water-tables in semiarid irrigated lands; Proc. Remote Sensing of Arid and Semi-arid Lands, Cairo, ERIM, Ann Arbor, p. 697-708, 1982.

Localisation des nappes d'eau perchés responsables de l'ensolement des sols par inertie thermique.

1006. LAURIOL, B., Univ. Sherbrooke (Géographie):
Etude de la couverture neigeuse de l'Ungava par télédétection de 1967 à 1980, Québec, 1981-83.

Voir:
Evolution de la couverture neigeuse du nord-est du Canada par télédétection; Annales de l'ACFAS, vol. 49, p. 20, 1982.

1007. PARRY, T.T., GRANBERG, H.B., MACLEAN, P., HOUSTON, L., McGill Univ. (Geography):
Mobility model development-terrain characteristics, 1980-.

To determine the terrain parameters necessary to effectively model vehicle performance in a northland environment with emphasis on muskeg and snow-covered terrain.

1008. SLANEY, V.R., Geol. Surv. Can.:
Remote sensing applications, 1981-.

1009. TANGUAY, M.G., PETRYK, A.A., SEUTHE, C., Québec Ministère l'Énergie et Ressources:
Feasability study for an analysis of the photo-lineaments of the Anticosti Basin area, 1983.

The objective of this remote sensing study of the Anticosti-Mingan Islands region is to determine the feasability of distinguishing linear images over a relatively unstructured marginal continental sedimentary platform sequence. This preliminary account is part of a proposed (Petryk) detailed statistical study of the structural lineaments on 1:15 000 to 1:40 000 black and white aerial photos and on false color remote sensing images.

1010. TANGUAY, M.G., SEUTHE, C., GAGNIER, B.-M., École Polytechnique (Génie minéral):
Applications des images Landsat en génie et en géologie; applications des images radar SAR en géologie, 1979-83; thèse de maîtrise (Gagnier).

Voir:
Images Landsat: Guide d'utilisation et source d'informations géologiques pour la région de Rouyn-Noranda; Rpt. de recherche EP82-R-17, École Polytechnique, 1982.

Images Landsat: Exemple d'utilisation géologique pour la région de Val d'Or, Québec; Rpt. de recherche EP82-R-38, École Polytechnique, 1982.

Images Landsat: Analyse sectorielle des linéaments et interpretation des grandes structures dans la région de Rouyn-Noranda, Québec; Rpt. de recherche EP-82-R-39, École Polytechnique, 1982.

Trouver une méthodologie d'application des données des images Landsat et des images radar aux diverses fins en géologie et en génie; exploration minérale, cartographie géologique, tectonique, étude d'environnement, investigation des sites. Applications aux régions de Noranda, Val d'Or, Chibougamau et Sherbrooke.

ANCIENT SEDIMENTS/
SÉDIMENTS ANCIENS

1011. ASPLER, L., DONALDSON, J.A., Carleton Univ. (Geology):
Sedimentology, stratigraphy and structure of the Nonacho Basin, Northwest Territories, 1978-83; Ph.D. thesis (Aspler).

Field and laboratory work completed, thesis in preparation.

1012. BANERJEE, I., Geol. Surv. Can.:
Stratigraphy and sedimentology of the Mannville Group, southern Alberta, 1982-.

1013. CAMERON, B.W., COLWELL, J.A., Acadia Univ. (Geology):
Origin of chert, Scots Bay Formation (Jurassic), Nova Scotia, 1982-84.

It is hypothesized that the chert nodules of the Scots Bay Formation of early Jurassic age from the Fundy Basin of Nova Scotia are at least in part penecontemporaneous in origin. Structures resembling "pseudostromatolites" have been found that suggest precipitation of silica associated with hot springs that may have developed after and above extensive basaltic extrusions. The nodules are cored by tree-trunk-like nuclii. Extensive infilling of void spaces by secondary silica precipitation indicates a complex paragenesis. These nodules occur in the basal fresh-water carbonate facies of the otherwise terrigenous Scots Bay Formation.

1014. CHANDLER, F.W., Geol. Surv. Can.:
Redbed sequences in Canada, 1976-.

1015. CHANDLER, F.W., Geol. Surv. Can.:
Proterozoic red beds of Richmond Gulf, Quebec, 1977-.

1016. CHIARENZELLI, J., DONALDSON, J.A., MILLER, A.L., LeCHEMINANT, A.N., Carleton Univ. (Geology), Geol. Surv. Can.:
Origin and diagenesis of the sub-Thelon regolith. Aberdeen Lake area, Northwest Territories, 1981-83; M.Sc. thesis (Chiarenzelli).

See:
Geology of Aberdeen Lake map area, District of Keewatin: Preliminary report; Geol. Surv. Can., Paper 83-1A, p. 437-448, 1983.

Field work completed, thesis in preparation.

1017. COOK, D.G., Geol. Surv. Can.:
Comparative studies of structural prototypes and/or sedimentary environments, 1970-.

1018. DONALDSON, J.A., KERANS, C., ROSS, G., Carleton Univ. (Geology):
Sedimetnology and stratigraphy of the Hornby Bay and Dismal Lakes groups, Northwest Territories, 1978-83; Ph.D. theses (Kerans, Ross).

See:
The Big Bear Erg: a Proterozoic aeolian sand sea in the Hornby Bay Group, Northwest Territories, Canada; Internat. Assoc. Sedimentology, 11th Internat. Cong., Abstracts, p. 68, 1982.

Field work completed; thesis by Kerans completed; thesis by Ross in final stages; several papers in preparation.

1019. DUNN, C.E., Saskatchewan Geol. Surv.:
Geology of the Middle Devonian Dawson Bay Formation in Saskatchewan, 1974-84.

See:
Geology of the Middle Devonian Dawson Bay Formation in the Saskatoon potash mining district, Saskatchewan; Saskatchewan Geol. Surv., Rept. 194, p. 117, 1982.

Geology of the Middle Devonian Dawson Bay Formation in the northern part of the Williston Basin; in: Fourth Internat. Williston Basin Symp., Saskatchewan Geol. Soc., North Dakota Geol. Soc., p. 77-88, 1982.

Describe the geology of the Dawson Bay Formation within Saskatchewan. The study includes stratigraphy, sedimentation, depositional enviornment, diagenesis, structure, groundwaters, and some paleontologic, rock mechanics, mineralogic, geochemical and geophysical observations. Of prime concern is the relationship of the strata to the underlying potash horizons of the Prairie Evaporite.

1020. EMORY-MOORE, M., HALE, W.E., VAN DE POLL, H.W., SCHAFER, C.T., Univ. New Brunswick (Geology), Geol. Surv. Can.:
Mineralogical characteristics of gold-bearing sediments, eastern shore, Nova Scotia, 1981-83; M.Sc. thesis (Emory-Moore).

The site of investigation, in the off-shore region of southeastern Nova Scotia, covers an area of approximately 37 km x 62 km in which 100 surface sediment samples have been collected. Thirty samples have undergone grain size and heavy mineral analysis, the results reported in the attached paper. Grain size analysis of these samples incorporates the mean, sorting, skewness, kurtosis with bivariate plots of all combinations. Heavy mineral separates include all sand fractions as well as the 4 phi clay fraction. The remaining 70 samples are presently undergoing similar analysis in an attempt to establish a more definitive data base. Future work will encompass a morphiometric analysis of the coarse gravel and cobble fractions as well as an evaluation of Au assays, XRF analysis and a Sparker seismic survey of the recognizable units within the modern sedimentary sequence. The computer will be used for graphic illustrations of the spatial distribution of all variables and for the statistical analysis of results.

The investigations are expected to contribute to: 1) reconstruction of the depositonal and transportive history of the off-shore sediments; 2) a qualitative evaluation of the shallow marine processes affecting present sediment distribution patterns; 3) definition of sedimentological parameters which are associated, either directly or indirectly, with the gold distribution; and 4) a comparative study of other placer gold deposits with the off-shore gold-bearing sediments of southeastern Nova Scotia.

1021. EYLES, N., Univ. Toronto (Scarborough, Geology):
Glaciomarine sediments of the Irish Sea: implications for basin history and geotechnical practice for hydrocarbon exploration, 1982-84.

Detailed logging of thick and extensive (25 km) sequences on the Isle of Man employing newly devised diamict lithofacies codes suggests that diamicts there are complex assemblages and result from the interplay of 1) accumulation of massive diamict by pelagic rain-out of suspended fines with coarser ice-rafted debris, 2) episodic or continuous traction current activity, and 3) downslope resedimentation with generation of turbidites. Diamict assemblages have planar geometries and are bounded on upper and lower surfaces by sharp and conformable, gradational, interbedded and loaded contacts. Deposition of diamict assemblages appears to have occurred under a floating ice margin. Each diamict assemblage commonly exhibits characteristics indicating the operation of two or more end member processes. A three-part ratio reflecting the relative importance of the three processes for each assemblage can be used in paleoenvironmental reconstructions. Similarities between the Isle of Man sequences and others of the Irish Sea Basin identified by seismic reflection and drilling indicate the greater significance of glaciomarine sedimentation than is allowed for in current basin histories. The sequences are excellent models for foundation conditions on other glaciated marine shelves, e.g. North Sea, in connection with oil and gas structures.

1022. EYLES, N., DUTTON, B., EYLES, C., Univ. Toronto (Scarborough, Geology):
Facies of glaciolacustrine diamict deposition in the Great Lake basins, 1980-.

See:
Sedimentation in a large lake: a reinterpretation of the late Pleistocene stratigraphy at Scarborough Bluffs, Ontario, Canada; Geology, vol. 11, no. 3, p. 146-152, 1983.

Early(?) and Middle Wisconsin glaciosedimentary facies at Scarborough Bluffs, Ontario; a field guide; Internat. Assoc. Sedimentologists, 11th Congr., Guidebook 10A, p. 65-73, 1982.

Newly devised descriptive techniques (lithofacies codes) developed for diamicts emphasizes facies variability in the classic Late Pleistocene glaciogenic sequence of multiple diamicts at Scarborough Bluffs, Ontario, Canada. Detailed sedimentological logging through three diamict unis (previously formalized as the Sunnybrook, Seminary and Meadowcliffe Tills) and intervening sandy lithofacies shows the following; absence of glacitectonic structures and diamicts associated with grounded glacier ice, traction current activity during diamict accumulation, post depositional resedimentation of diamicts into topographic lows accompanied by turbidite activity, a subaqueous origin for intervening sandy lithofacies and loaded, transitional and interbedded contacts between sands and diamict.

The Bluffs sequence can be interpreted as the preserved bottom stratigraphy of a substantial lake; the top of the Meadowcliffe diamict assemblage is c. 95 m above the present level of Lake Ontario. The bottom stratigraphy results from basinward progradation of deltaic sandy lithofacies over stony glaciolacustrine muds deposited below floating ice whether ice shelf, ramp or bergs. A facies model is presented for glaciolaustrine diamict deposition on the floors of enlarged Pleistocene lakes trapping substantial volumes of fine grained suspended sediment. This model is being tested against sequences elsewhere in the Great Lakes.

1023. EYLES, N., EYLES, C., Univ. Toronto (Scarborough, Geology):
The sedimentology of the Late Precambrian Port Askaig 'tillites' – implications for Dalradian palaeogeography, 1982-84; Ph.D. thesis (Eyles, C.).

On the Garvellach Islands in southwest Scotland, 47 diamictite horizons in nearly 1000 m of strata of the Argyll Group of the Dalradian Supergroup have previously been interpreted as subglacial deposits. Use of newly devised descriptive techniques (lithofacies codes) emphasizes that the diamictite units record deposition by pelagic rain-out and ice rafting with intermittent traction current reworking on the sea-floor. A lower group of diamictites are not considered to be glacial but appear to be carbonate slope breccias and conglomerates resulting from local block faulting and slope failure on carbonate shelf margins. The depositional model has implications for the palaeogeography of the Iapetus Ocean and the origin of other diamictites in north-east Greenland and Spitsbergen.

1024. EYLES, N., EYLES, C., Univ. Toronto (Scarborough, Geology):
The sedimentology of the Yakataga Formation, Neogene to Holocene, Gulf of Alaska, 1983-85.

A facies model has been derived from extensive, thick exposures of glaciolacustrine deltaic and diamict sequences of the Lake Ontario Basin and raised glaciomarine strata of the Isle of Man in the Irish Sea Basin. This depositional model is now being tested by study of a thick glaciomarine sequence that is representative of the older basins in which oil and gas have been found. A unique opportunity is presented by the 1000 m thick Yakataga Formation exposed on Middleton Island in the Gulf of Alaska which reconnaissance work in the late 1950's suggested originated under the depositional regimes identified above. Analysis of lithofacies sequences from Middleton Island establishing sedimentology, geometry and continuity of individual lithofacies units within the overall tectonic setting of the Gulf would greatly extend our knowledge of glaciated basins for wider industrial application.

1025. FLACH, P.D., Alberta Research Council (Geol. Surv.):
Sedimentology of the McMurray Formation, Athabasca oil sands, Alberta, 1977-84.

1026. GILES, P.S., RUST, B.R., GIBLING, M.R., BOEHNER, R.C., MASSON, G., DILLES, S., BEST, M.A., Nova Scotia Dept. Mines and Energy, Univ. Ottawa (Geology):
Sydney Basin project, Nova Scotia, 1982-84; Ph.D. thesis (Masson), M.Sc. theses (Dilles, Best).

Project will continue 83/84 with work concentrated in southeastern parts of the Sydney Basin. Best will begin research on Upper Morien Group in spring of 1983.

1027. GRAVENOR, C.P., Univ. Windsor (Geology):
Pleistocene and pre-Pleistocene glaciomarine sedimentation, 1980-86.

See:
Patterns of Late Paleozoic glacial sedimentation on the southeast side of the Parana Basin, Brazil; Eleventh Internat. Cong. Sedimentology, abstracts, p. 76-77, 1982.

Stratified Late Dwyka glaciogene sediments in the Natal Midlands; Third Symp. Sedimentological Div. Geol. Soc. South Africa, abstract 1982.

During the course of investigating Pleistocene, Proterozoic and Paleozoic glaciomarine sediments in Canada, southeastern Brazil and South Africa, it was noted that massive diamictites up to 300 m. in thickness dominate the shelf environment. These diamictites have been variously assigned to deposition directly from the base of grounded ice to deposits from floating ice. The purpose of this project is to determine the origin of these diamictites and their enclosing strata by detailed vertical and horizontal fabric studies. This will be done by microfabric techniques and the anisotropy of magnetic susceptibility. This study will be complemented with detailed sedimentological studies of the diamictites and their enclosing strata. The specimens taken for microfabric analysis will also be used to study the paleomagnetic characteristics of the diamictites.

1028. HARRISON, R.S., Alberta Research Council (Geol. Surv.):
Sedimentology and stratigraphy of the bitumen-bearing Upper Devonian Grosmont Formation in northern Alberta, 1980-84.

See:
Geology and production history of the Grosmont carbonate pilot project, Alberta, Canada; Second UNITAR Conf. Future of Heavy Crude and Tar Sands, Caracas, Venezuela, 1982.

The Grosmont Formation (abstract); Can. Soc. Petrol. Geol. Sedimentology Conf., Calgary, Alberta, 1982.

Geological setting and production history of the Grosmont pilot project, northern Alberta (abstract); AAPG/SEPM Ann. Meeting, Program with Abstracts, 1982.

The geological setting of the Grosmont thermal recovery project: a bitumen-bearing Paleozoic carbonate horizon in northeastern Alberta (abstract); Internat. Assoc. Sedimentologists, 11th Congress, 1982.

The Grosmont Formation consists of a dolomitized series of shallowing-upward depositional cycles. Sedimentary facies encompass small reef-like buildups, subtidal low-energy carbonate sands and muds, and intertidal/supertidal sequences with minor evaporites. The rocks are extremely porous (commonly in excess of 20%) and have bitumen saturations which average well over 60%.

1029. HARRISON, R.S., HALLEY, R.B., Alberta Research Council (Geol. Surv.), USGS:
Genesis and diagenesis of Late Pleistocene carbonates of the Florida Keys; Origin of Key Largo, U.S.A., 1978-83.

See:
Late Pleistocene deposits of the Florida Keys; AAPG/SEPM Ann. Meeting, Program with Abstracts, 1982.

Stratigraphy and sedimentology of Key Largo and Big Pine Key, Florida (abstract); Internat. Assoc. Sedimentologists, 11th Congress, 1982.

1030. HILL, R., Geol. Surv. Can.:
Stratigraphic and sedimentological investigation of the Waterton and Altyn formations (Purcell Supergroup), southwestern Alberta, 1982-.

1031. KOSTER, E.H., Alberta Research Council (Geol. Surv.):
Sedimentology and coal resources of the Upper Cretaceous Judith River Formation, southern Alberta plains, 1981-84.

The project comprises two integrated aspects which are proceeding simultaneously. Phase I: the main topic of a 1983 guidebook, concerns the acquisition of outcrop data from the Park with general objectives: 1) to interpret paleoenvironments with particular reference on potential coal development and transport/deposition of vertebrate remains; and 2) to discern any temporal and/or spatial trends in these paleoenvironments.

Phase II concerns the synthesis and interpretation of all available subsurface geophysical/core data (oil and gas wells, coal company and A.R.C. testholes) over the entire study area with general objectives: 1) to map the distribution, thickness and continuity of coal seams; and 2) to interpret inter-seam stratigraphy with a view to deciphering the overall geologic and depositional history of this part of the Upper Cretaceous molasse sequence.

1032. KRAMERS, J.W., Alberta Research Council (Geol. Surv.):
Sedimentology of the Grand Rapids Formation, Wabasca oil sand deposit, Alberta 1972-85.

See:
Oil sands of the Grand Rapids Formation, Alberta: nearshore sedimentation in a high energy epeiric sea (abstract); Internat. Assoc. Sedimentologists, 11th Congr., Abstracts of Papers, p. 8, 1982.

Grand Rapids Formation, North-Central Alberta: an example of nearshore sedimentation in a high energy, shallow, inland sea (abstract); Amer. Assoc. Petrol. Geologists Bull., vol. 66, no. 5, p. 589-590, 1982.

1033. Le GALLAIS, C.J., HESSE, R., STEARN, C.W., McGill Univ. (Geological Sciences):
Stratigraphy, sedimentation and basin evolution of the Pictou Group (Pennsylvanian), Oromocto Sub-basin, New Brunswick, 1979-83; M.Sc. thesis (Le Gallais).

1034. LONG, D.G.F., LESLIE, C., Laurentian Univ. (Geology):
Placer gold potential of Huronian strata, Ontario, 1981-84; M.Sc. thesis (Leslie).

See:
Placer gold potential of the Gowganda Formation along the northern margin of the Cobalt Embayment; Ontario Geol. Surv., Misc. Paper 106, p. 198-200, 1982.

To determine the sedimentary framework of sedimentary gold concentrations (if any) in Huronian strata of Northern Ontario, and provide guidelines for future explanation. Studies involve the Mississagi Formation (1981), Gowganda Formation (1982), and Lorrain Formation (1983). Placer concentrations have been found in reworked conglomerate assemblages (Scott and Danjeck type braided streams) in the Mississagi Formation. Lack of fluvial strata in the Gowganda precludes extensive placers. High gold values have been obtained from the Lorrain.

1035. MIALL, A.D., Univ. Toronto (Geology):
Sedimentology of Huronian glacial deposits, northern Ontario, 1981-.

Application of modern facies model techniques to glacial deposits, particularly those deposited subaqueously, has revealed the need for a radical re-evaluation of earlier interpretations of "tillites" and related strata. Many are now thought to be sediment gravity flow deposits derived by resedimentation of ice-derived detritus. Work on the Gowganda Formation (Huronian) of northern Ontario has led to the development of an ice-shelf model for this unit, and has contributed to proposals for a new lithofacies analysis scheme for glacial deposits.

1036. MIALL, A.D., EBERTH, D., Univ. Toronto (Geology):
Basin analysis of fluvial deposits, 1966-; Ph.D. thesis (Eberth).

To investigate the fluvial sedimentary style and internal stratigraphic architecture of ancient fluvial basins. Previous research has focussed on problems of cyclic sedimentation and the nature of tectonic control of fluvial processes. To generate generalized models for fluvial depositional systems by studying a variety of ancient sequences current research areas include Permian deposits in New Mexico (Eberth) and the Cenozoic of the Canadian Arctic.

1037. NEALE, K.L., DONALDSON, J.A., WEBER, W., GILBERT, H.P., Carleton Univ. (Geology):
Stratigraphy and sedimentology of the Island Lake area, northern Manitoba, 1981-83; M.Sc. thesis (Neale).

Field work completed, laboratory studies in progress.

1038. NOBLE, J.P.A., Univ. New Brunswick (Geology):
Faunal and sedimentary history of the northern Appalachian Orogen, Silurian-Devonian, 1976-90.

Taxonomic studies of heliolitid corals from the Silurian of New Brunswick have been completed, and a manuscript describing the syringoporid and halysitid corals from the same area is in the final stages of preparation. A taxonomic and paleoecologic study of the stromatoporoids of the late Silurian West Point reef complex by graduate student, C. Pope, is also almost finished. For comparative purposes and to provide data for subsequent biostratigraphic and biogeographic studies (in progress) it was further necessary to collect faunas from type areas in England and Gotland.

In addition to these paleontologic studies a large number of stratigraphic sections in New Brunswick and Quebec have been measured and the sediments and their associated faunas examined in detail. Much of the data from the Llandovery Armstrong Brook and Limestone Point formations and the Wenlock La Vieille Formation is quantitative and has resulted in paleoenvironmental and paleogeographic reconstructions presently in preparation.

1039. PATERSON, D.F., Saskatchewan Geol. Surv.:
Geology and shale-oil potential of the Speckled Shales (Cretaceous) in Saskatchewan, 1982-84.

Sees
Saskatchewan Geol. Surv., Misc. Rept. 82-4, 1983.

The Cretaceous Speckled Shales outcrop on the Pasquia Hills of east-central Saskatchewan and have been shown to contain up to 46L/tonne oil over a 33 m interval. The strata extend westward to the Alberta border and southward to the United States border, thus covering some 270,000 km^2 in Saskatchewan. To show their geographic limits, depth of burial, thickness and variations in oil content with a view to assessing their economic potential.

1040. PRIME, G., SCHENK, P.E., GIBLING, M.R., BOEHNER, R.C., WALDON, J., Dalhousie Univ. (Geology):
Sedimentology and sedimentary tectonics of Carboniferous sediments in Antigonish County, Nova Scotia, 1981-83; M.Sc. theses.

Sees
From sabkha to coal swamp – the Carboniferous sediments of Nova Scotia and southern New Brunswick; Internat. Assoc. Sedimentologists, 11th Congr., Excursion 4A, Field Excursion Guide Book, 1982.

1041. ROTTENFUSSER, B.A., Alberta Research Council (Geol. Surv.):
Peace River oil sands study, northern Alberta, 1975-83.

Sees
Facies of the Gething Formation, Peace River Oil Sands deposit; in Canada's Giant Hydrocarbon Reservoirs, W.G. Cutler (ed.), CSPG, Calgary, 1982.

Cores have been logged throughout the heavy oil sands deposit and data on grain size, heavy oil saturation and mineralogy are being generated. Depositional environments, diagenesis, and mineralogy affect saturation and potential extraction of the heavy oil. Data will be provided to aid in planning in-situ recovery projects.

1042. RUST, B.R., Univ. Ottawa (Geology):
Sedimentology of Cumberland Group south of Joggins, Nova Scotia, 1981-83.

The Pennsylvanian Cumberland Group near Joggins, Nova Scotia is an alluvial succession containing channel sandstones and overbank deposits comprising sheet sandstones, mudrocks and coals. The section between McCarren Creek and Ragged Reef Point includes a 600 m megasequence in which channel sandstones increase in abundance upwards.

The channel sandstones in the lower 500 m of this megasequence have limited lateral extent, stepped bases and numerous sub-horizontal internal erosion surfaces. Commonly they have sharp tops, and do not fine upwards, nor show upward decrease in the scale of sedimentary structures. Rare lateral-accretion strata occur only in the upper parts of channel fills. Channel evolution is attributed to vertical accretion in anastomosing channels, accompanied by some widening and lateral migration, terminating with avulsion. In the uppermost 100 m of the megasequence lateral channel stability decreased and channel density increased in transition to a braided pattern.

Overbank deposits comprise levee and crevasse-splay sheet sandstones, transitional upward, downward and laterally into floodbasin mudrocks. Levee sandstones characteristically coarsen upward and bear upright tree trunks. Crevasse-splay sandstones fine upwards or coarsen, then fine. Small-scale channels also fine upwards and are interpreted as crevasse-splay channels. Floodbasin deposits comprise grey to red mudrocks, rooted carbonaceous shales and coal seams.

Red colouration increases up-section, as coal seams disappear and channel sandstones become more abundant. This is attributed to an increasingly dry temperate paleoclimate, and to tectonic rejuvenation. The lack of thick coal seams is attributed to low water tables and to frequent progradation of crevasse-splays over swamps, as a result of locally rapid basin subsidence.

1043. RUST, B.R., FRENCH, H.M., NALDRETT, D.N., Univ. Ottawa (Geology):
Late Quaternary marine glacial deposits of the Champlain Sea near Ottawa, 1981-83; Ph.D. thesis (Naldrett).

Sees
Flow tills in late Quaternary subaqueous outwash deposits of the Champlain Sea near Ottawa, Canada; Geol. Assoc. Can. – Mineral. Assoc. Can., Program with abstracts, vol. 7, p. 78, 1982.

Late Quaternary sands and gravels are extensively exposed in pits on the northwest margin of the Twin Elm ridge, 20 km south of Ottawa. Deformation into broad folds and associated faults is attributed to meltout of buried ice. The succession, which contains marine fossils at the top, mainly comprises stratified gravel, with some sand. It is interpreted as subaqueous outwash, formed near an ice margin submerged by the Champlain Sea.

The fossiliferous strata represent the sublittoral phase of colonisation by the fauna. Diamicton units up to 2 m thick are interbedded with stratified deposits, in most cases conformably. Locally, a diamicton unit comprises up to five lenticular subunits up to 40 cm thick, separated by thin sand layers. Clast fabrics in the diamictons show little preferred orientation, but platy clasts commonly stand at high angles to the basal contact. The diamictons are interpreted as flow tills that slid off the glacier surface into the sea, where they were partly reworked by subaqueous processes. Other exposures in the area show similar features and are being investigated to provide an integrated environmental interpretation for the late Champlain Sea deposits of the Ottawa area.

1044. RUST, B.R. GIBLING, M.R., MASSON, G., DILLES, S., BEST, M.A., Univ. Ottawa (Geology), Dalhousie Univ.
Sedimentology in relation to coal deposits, Sydney Basin, Nova Scotia, 1981-83; Ph.D. thesis (Masson), M.Sc. theses (Dilles, Best).

Sees
The sedimentology of the lower Morien Group near Port Morien, Nova Scotia; Geol. Surv. Can., Paper 83-1A, p. 183-186, 1983.

Three facies assemblages have been recognized in the alluvial Morien Group (Westphalian C, D age) of the Sydney Basin, Nova Scotia. The conglomerate-sandstone assemblage is characterized by thin pebble-conglomerates alternating with dominant sandstones, a paucity of mudrocks and a lack of in situ coal. It is attributed to deposition on a moderately high-energy braidplain. The sandstone assemblage, containing thin granule layers within sandstones, minor coals and about 10% mudrocks is interpreted as a distal braidplain deposit. The third assemblage, mainly comprising alternations of mudrocks and fining-upward sandstone sequences, is attributed to deposition on a meandering-fluvial plain. Mudrocks make up about 50% of this assemblage and contain significant coal seams, due to the formation of thick peats as floodplain muds compacted. The alternating assemblage was initiated earlier in the eastern part of the basin than in the west, but developed fewer, thinner coal seams at that time. Coastal exposures and offshore cores show no evidence of deltaic sedimentation.

1045. SCHENK, P.E., Dalhousie Univ. (Geology):
Possible replacement of carbonate by anhydrite of lower Windsor Group (Carboniferous) evaporites, southern Nova Scotia, 1978-84.

Sees
Massive replacement by anhydrite of thick cyclic intertidal carbonates of the Windsor Group (abstract); Internat. Assoc. Sedimentologists, 11th Congr., Theme 3, p. 11, 1982.

1046. SCHENK, P.E., Dalhousie Univ. (Geology):
Probable tillite of Late Ordovician age in Meguma Zone, related to Saharan glaciation, 1982-84.

1047. SCHENK, P.E., RYALL, P., JANSA, L., JAMES, N.P., Dalhousie Univ. (Geology), Memorial Univ. (Earth Sciences):
Bermuda carbonate environments, diagenesis and stratigraphy by submersible, 1981-83.

Sees
The volcanic evolution of Bermuda determined from deep-drilling and submersible observations; EOS, vol. 63, p. 473, 1982.

Field Guide to Pleistocene and modern carbonates of Bermuda; Bermuda Biol. Station, Spec. Publ. 25, 1983.

1048. SHILTS, W.W., Geol. Surv. Can.:
Mineral indicator tracing, southern Keewatin, 1970-.

1049. SONNENFELD, P., Univ. Windsor (Geology):
Evaporite formation, 1978-83.

1050. SONNENFELD, P., Univ. Windsor (Geology):
Miocene evaporites of the Mediterranean region, 1982-83.

A detailed evaluation of models applicable to genesis of Upper Miocene evaporites in the Mediterranean region.

1051. SONNENFELD, P., HUDEC, P.P., DERMITSAKIS, M., Univ. Windsor (Geology), Univ. Athens:
Upper Miocene gypsiferous sandstones, 1977-83.

Sees
Matrix provenance of Upper Miocene gypsiferous conglomeratic sandstones; 28th Congr. and Plenary Assembly Internat. Commission for the Scientific Expl. of the Mediterranean Sea, vol. 28, no. 7, 1983.

Upper Miocene sandstones on the north rim of the coeval gypsum and halite deposits under the floor of the Mediterranean Sea (1.5-3.5 km thick) contain as heavy minerals oxides in the Aegean Sea, where there are local anhydrite beds. On Crete, the Ionian islands, Italy, and Sicily, the same sands have a gypsum matrix. On Corsica Sardinia, in Spain and Algeria, the gypsum matrix is absent, the heavy minerals do not contain oxides. Instead, there are neoformations of euhedral pyrite and marcasite druses.

1052. SONNEVELD, E., BARNES, W.C., Univ. British Columbia (Geological Sciences):
Paleotopography of the pre-Cretaceous unconformity and sedimentation patterns of the Lower Mannville Group near Drumheller, Alberta, 1980-83; M.Sc. thesis (Sonneveld).

The paleotopography on the pre-Cretaceous unconformity and distribution of overlying Aptian and Albian Mannville sediments has been studied in an area near Drumheller, Alberta. From core examination and geophysical well log interpretation, regional correlation of units has been made. Paleontological data was obtained to aid in correlation of units and evnironmental interpretation. Detailed petrographic examination of sandstones with additional information from scanning electron microscope and x-ray diffraction studies has been completed on a local scale.

Strata of the Cretaceous Mannville Group rest with slight angular unconformity on Mississippian shales and carbonates. Distribution of the Cretaceous clastic units reflects the relief on the erosional surface, which is partially controlled by the subcropping lithologies. The basal quartz sandstone in the Drumheller area has previously been considered one sand unit. Careful examination reveals the existence of several distinct units speparated by pyritization in the sands.

A model has been constructed to account for the distribution of Lower Mannville strata in the study area. Lowermost Cretaceous sands reflect basal filling of the erosional surface, where as by mid-Aptian time, a marine transgression is clearly indicated.

1053. STEVENS, G.R., COLWELL, J.A., Acadia Univ. (Geology):
Clay mineral diagenesis in Cenozoic sediments, Labrador Shelf, 1979-83.

Analysis of samples complete, correlation and final report in progress.

1054. TASSÉ, N., INRS-Géoressources:
Sédimentation et diagenèse en relation avec les minéralisations dans les Basses Terres du Saint-Laurent, 1983.

L'objectif du projet est de caractériser pétrographiquement et géochimiquement les indices minéralisés des Basses Terres du Saint-Laurent et de les relier aux paléoenvironnements et à l'histoire diagénétique de l'encaissant afin d'en déterminer l'origine.

1055. TASSÉ, N., INRS-Géoressources:
Origine de nodules de manganèse dans la région de Port Daniel, Gaspésie, Québec, 1983.

L'objectif du projet est de déterminer les mécanismes de concentrations du manganèse dans des sédiments du complexe de rivière Port Daniel Nord, Gaspésie.

1056. VAN DE POLL, H.W., PLINT, A.G., PATEL, I., FOLEY, P., D'ORSAY, A.M., TAWASHI, A., Univ. New Brunswick (Geology):
Basin analysis of the Devonian and Permo-Carboniferous strata of Eastern Canada, 1969-; M.Sc. theses (Foley, D'Orsay), PH.D. thesis (Tawashi).

Seen:
Upper Pennsylvanian sediment dispersal and paleochannel orientation in the western part of the Sydney Coalfield, Cape Breton, Nova Scotia; Maritime Sediments and Atlantic Geology, vol. 18, no. 2, p. 83-90, 1982.

Alluvial fan and piedmont sedimentation in the Tynemouth Creek Formation (Lower Pennsylvanian) of southern New Brunswick; Maritime Sediments and Atlantic Geology, vol. 18, no. 3, p. 104-128, 1982.

Current studies include: 1) depositional and post depositional history of the Prince Edward Island redbeds; 2) structure, stratigraphy, depositional history and physical diagenesis of Carboniferous strata of the Tynemouth Creek, St. Martins area, New Brunswick, and the Parrsboro area of Nova Scotia; 3) depositional history and physical diagenesis of the coal bearing strata of the Point Aconi area, Cape Breton Island, Nova Scotia; 4) evidence of physical diagenesis in Devonian and Permo-Carboniferous strata of Eastern Canada; 5) stratigraphy, facies and economic geology of the Tatamagouche synclinal area, Nova Scotia; and 6) laboratory experiments in rheoplasis during sediment intrusion.

1057. WILSON, M.A., PATERSON, D.F., Saskatchewan Geol. Surv.:
Sedimentology of the Mannville Group (Lower Cretaceous) in the Tangleflags area, west-central Saskatchewan, 1981-83.

An investigation into the sedimentology of the Mannville Group in the Tangleflags area was initiated in September 1981. It focuses on the interpretation of the depositional environments present in this area. An attempt will be made to relate the sedimentological parameters to the physical properties and diagenetic features of the sediments. The study involves the examination of cores and geophysical well logs.

1058. WOLF, R.R., DALRYMPLE, R.W., Queen's Univ. (Geological Sciences):
Sedimentology of the Cambro-Ordovician Sandstones of Eastern Ontario, 1983-85; M.Sc. thesis (Wolf).

To determine the depositional environments in which, and the processes by which, these sandstones formed; to provide better definition of the genetic controls on the distribution of silica sand resources and to establish intraformational correlations on the basis of environmental facies.

RECENT AND UNCONSOLIDATED SEDIMENTS/SÉDIMENTS RÉCENTS ET NON CONSOLIDÉS

1059. ADSHEAD, J.D., Geol. Surv. Can.:
Geological characterization of Arctic lakes: sediment properties and sedimentary processes, 1977-.

1060. AMOS, C.L., Geol. Surv. Can.:
Sediment dynamics at the head of the Bay of Fundy, 1978-.

1061. AMOS, C.L., Geol. Surv. Can.:
Stability and transport of sediments on Continental shelves, 1980-.

1062. BORNHOLD, B.D., Geol. Surv. Can.:
Marine surficial geology and sedimentation, British Columbia, 1975-.

Seen:
Morphology of a submarine slide, Kitimat Arm, British Columbia; Geol. Soc. Amer., Geology, vol. 10, no. 11, p. 588-592, 1982.

1063. CAMERON, B.W., Acadia Univ. (Geology):
Recent quartzose algal mats of Massachusetts and Nova Scotia, 1976-89.

Unconsolidated, laminated quartz silt and sand is bound by mucous-secreting blue-green algae (Lyngbya, Microcoleus, etc.) to form algal mats in high intertidal and supratidal protected areas in spits and in marshes behind barrier beaches and barrier islands.

The algal mats are stratified into three vertical zones: 1) upper brownish-green algal layer; 2) middle pinkish, anaerobic, photosynthetic purple sulfur bacterial layer; and lower black, anaerobic, organic-rich decay bacterial layer. Larger structures include gas domes, desiccation polygons, elongated ridges, rolled mats, mounds and distorted mats redeposited after floatation.

1064. CAMERON, B.W., JONES, J.R., Acadia Univ. (Geology):
Landward migration and environmental complex of the Plum Island Barrier Island System, Massachusetts, 1975-83.

Because sealevel has changed less in northeastern Massachusetts than anywhere along the east coast over the last 6000 years B.P., Plum Island was chosen to test the spit and the ridge-embayment models for barrier island formation. Results to-date favor the spit accretion model in association with dune migration, overwash processes and storm induced erosion and sedimentation. Current research involves spit subenvironmental analyses and submarsh paleoenvironmental determinations.

1065. DALRYMPLE, R.W., ZAITLIN, B., Queen's Univ. (Geological Sciences):
Sedimentary facies in macrotidal estuaries, 1971-86.

Seen:
Beach and nearshore depositional environments of the Bay of Fundy and southern Gulf of St. Lawrence; Guidebook, Excursion 6A, Internat. Assoc. Sedimentologists, 11th Congr., 1982.

Role of megaripples in tidal sandwave dynamics and internal structure formation (Bay of Fundy); Abstracts, Internat. Assoc. Sedimentologists, 11th Congr., 1982.

Megaripples, hydraulics and the generation of size populations; ibid., p. 84, 1982.

To determine the facies model(s) for a macrotidal estuary and to document the depositional processes operating there. As byproducts of this, fundamental research into the dynamics of bedforms, sediment transport, and structure preservation is also being carried out. In the last 2 years a detailed examination of the morphology and internal structures has been completed, and a new exposure indicator with high preservation potential has been documented. Facies located headward of the tidal sand bars have also been examined in greater detail than previously and some very unusual features that include extensive (25 km^2) of upper flow regime plane bed, annual depositional cycles in mudflats, large-scale flutes, and tidally-dominated fluvial point bars have been highlighted for further detailed examination. Investigation of the depositional history and three-dimensional geometry of the deposits has begun using a portable vibracorer. The main emphasis remains on Cobequid Bay but reconnaissance examination of Cumberland Basin has been undertaken with the aim of starting a comparative study of these disparate environments.

1066. HOOGENDOORN, E.L., DALRYMPLE, R.W., Queen's Univ. (Geological Sciences):
Sedimentation and bedform mobility on Sable Island Bank, 1983-86; PH.D. thesis (Hoogendoorn).

To develop a facies model of sedimentation on Sable Island Bank with emphasis on the sedimentary processes and internal structures. The large-scale sandwaves will receive special attention. More specific objectives are: 1) delineation of the types of bottom morphology and their areal distribution; 2) determination of the relationship between bottom morphology, grain size characteristics, and the wave and current regimes; 3) identification of the internal physical and biogenic strucutres;

4) investigation of the Holocene history of the Bank; 5) documentation of bedform mobility and bottom stability; and 6) synthesis of all of the above into a facies model for the sedimentary deposit being formed.

1067. JANSA, L.F., Geol. Surv. Can.:
Stratigraphy and sedimentology of the Mesozoic and Tertiary rocks of the Atlantic continental margin, 1971-.

1068. LAST, W.M., Univ. Manitoba (Earth Sciences):
Sedimentology and geochemistry of saline lakes of the northern Great Plains, 1981-86.

Over the past year the reconnaissance level investigations of the saline and hypersaline lakes of the northern Great Plains has been completed. The water and sediment samples analyses are nearly completed. Papers dealing with the general results on a broad, regional scale are either in press or being prepared.

1069. LOCKHART, B., LAST, W.M., Univ. Manitoba (Earth Sciences):
Occurrence and origin of gypsum in Lydden Lake, Saskatchewan, 1982-83; B.Sc. thesis (Lockhart).

Lydden Lake, located about 100 km west of Saskatoon, Saskatchewan, is a small (2.5 km^2) playa basin typical of many of the alkaline, hypersaline lakes of the northern Great Plains. During much of the year the basin contains a concentrated sodium sulphate-rich brine in which a variety of both hydrated and anhydrous sulphate salts precipitate. Stratigraphically, the sediments of the basin consist of several units of coarse crystalline evaporites interbedded with black, fine grained plastic and organic material. Although sodium and magnesium sulphates, such as mirabilite, thenardite and epsomite dominate the sediment record, gypsum is also present in varying amounts in the upper metre.

Most of the gypsum in the sediment consists of coarse silt and same sized euhedral crystals. Crystals showing dissolution pitting and varying degrees of rounding are also present in some portions of the section. Interlocked aggregates of crystals are, however, rare.

Much of the gypsum in Lydden Lake is likely authigenic in origin although the source of Ca^{+2} for this diagenetic reaction is somewhat enigmatic. Undersaturation of the present day surface brines with respect to calcium sulphate explains the absence of gypsum in the modern sediment and further points towards an early diagenetic origin. Rounding and pitting of crystals suggests a minor allogenic component or possibly exposure of the authigenic gypsum to differing hydrochemical conditions.

1070. LUTERNAUER, J.L., Geol. Surv. Can.:
Fraser Delta sedimentation, British Columbia, 1976-.

1071. LUTERNAUER, J.L., Geol. Surv. Can.:
Marine delta sedimentation, British Columbia, 1979-.

1072. McLAREN, P., Geol. Surv. Can.:
Environmental geology of eastern Arctic coasts, 1976-.

1073. McLAREN, P., Geol. Surv. Can.:
Coastal geology and processes of British Columbia, 1978-.

1074. OTTO, J.E., DALRYMPLE, R.W., Brock Univ. (Geological Sciences):
Sedimentation in the Sixteen Mile Creek lagoon, Ontario, 1980-83; M.Sc. thesis (Otto).

See:
Terrain characteristics and physical processes in small lagoon complexes; Ontario Geol. Surv., Misc. Paper, 1982.

The research first characterizes the physical and paleontological (palynology, algal spores) nature of the stratigraphic unit recognized in the Holocene fill of the Sixteen Mile Creek lagoon. Supplementary information from the Adjacent Fifteen and Twenty Mile Creek has also been obtained. These data have now been synthesized to give the historical development of the lagoon. Preliminary interpretations require two rapid instances of lake (Ontario) level rise in excess of that produced by isostatic rebound. These are dated at 1675 and 440 ^{14}C years B.P. The palynological and geochemical data also document human influence possibly dating back to pre-European settlement times. Pollution levels in the Sixteen Mile Creek lagoon are low.

1075. PELLETIER, B.R., Geol. Surv. Can.:
Bottom studies of the Beaufort Sea, 1972-.

1076. PIPER, D.J.W., Geol. Surv. Can.:
Near-surface geology of the Arctic Island channels, 1982-.

1077. RASHID, M.A., Geol. Surv. Can.:
Geochemical transformations and reactions of organic compounds in Recent marine sediments, 1975-.

1078. RUKAVINA, N.A., Environment Canada (National Water Res. Instit.):
Nearshore profile changes in the Great Lakes, 1978-85.

Profile monitoring was continued at a site on the Burlington Bar and profile changes during storms were measured on three occasions.

1079. SCHAFER, C.T., Geol. Surv. Can.:
The Recent paleoclimatic and paleoecologic records in fjord sediments, 1980-.

1080. SCHWEYEN, T.H., LAST, W.M., Univ. Manitoba (Earth Sciences):
Sedimentology and paleohydrology of Waldsea Lake, Saskatchewan, 1982-83; M.Sc. thesis (Schweyen).

The morphometry of a lake is extremely important in the distribution and early diagenesis of sediment within that lake. It is of even greater importance in small, relatively shallow meromictic lakes, where a change of one meter in chemocline elevation can "expose" a major portion of lake bottom surface to oxygenated water and possible bioturbation.

Morphometric parameters have been calculated for Waldsea Lake, Saskatchewan. Since its discovery as meromictic in 1971, the chemocline has dropped four meters; this change has availed approximately 35% of the lake bottom surface to oxygenated conditions and subsequent bioturbation. These changes may or may not be recorded in the sediment record.

Four major sedimentation units have been recognized in Waldsea Lake sediments. The youngest unit, at maximum 1 meter thick, is composed of black sapropel rich in aragonite laminations. The second unit is a grey to green mud of high gypsum silt content, with minor lenses of calcite sand and carbonate-cemented "hardgrounds", reaching a maximum thickness of 1 meter. The third unit is an aragonite laminated sapropel similar to the first, with a maximum thickness of about 20 centimeters. The oldest unit is a black organic rich mud with occasional mirabilite crystals and large vugs near the top. This unit has been penetrated to a maximum depth of 4 meters from the sediment-water interface, and probably represents a much lower hypersaline lake phase.

1081. SYVITSKI, J.P.M., Geol. Surv. Can.:
The physical behaviour of suspended particulate matter (spm) in natural aqueous environments, 1981-.

See:
Sediment character and provenance in a complex fjord: Hare Sound, British Columbia; Can. J. Earth Sci., vol. 19, no. 5, p. 1025-1044, 1982.

1082. SYVITSKI, J.P.M., Geol. Surv. Can.:
Sedimentology of fjords, 1981-.

1083. TAYLOR, R.B., Geol. Surv. Can.:
Coastal morphology and sediment dynamics, southeast and east Cape Breton Island, Nova Scotia, 1980-.

1084. VILKS, G., Geol. Surv. Can.:
Pleistocene-Holocene basin sedimentation, 1975-.

1085. MUNN, R.E., BOVILLE, B.W., HARE, F.K., Univ. Toronto (Instit. Environmental Studies):
Estimation of carbon content of organic terrain in Canada and mode of accumulation in Holocene times, 1981-83.

To collect and analyze sufficient data to compute the amount of non-living organic carbon stored in the soils and under lakes in Canada, together with estimates of the reservoir's growth and rate of change. An initial numerical classification of the surface characteristics of Canada had been carried out under the direction of Hare. These data were available in computer format and formed the basic areal estimates for the calculations reported. New data were made available by a variety of university, provincial and federal personnel and agencies as referenced in the text. The coordinating activities of the Canadian Peat Forum provided valuable contacts and information, in addition to those available through the contracting Agency.

The project was carried out in three individual but coordinated activities. In the first part, best estimates of all parameters were transformed into individual values for each point of the rectangular grid (1290 land points). Integrated values and maps of grid point values for these data were presented. In the second part, there was a separate evaluation of the carbon reservoirs by provinces so as to take advantage of the energy resource surveys carried out by provincial agencies. In the third part, a thorough analysis was performed on all lake sediment and peat cores that could be assembled in the short time available for the study. The three parts were presented as individual sections but all the data have been crossed-checked and coordinated.

1086. RUTHERFORD, G.K., van LOON, G.W., Queen's Univ. (Geography):
Pedological properties of mining tailings derived from iron and uranium mining in southeastern Ontario, 1982-83.

Tailings were collected from various parts of the tailings ponds at the iron mining site at Marmora and at the uranium mining site at Bancroft.

The oxide tailings are being analysed by standard chemical and pedological analyses with the object of obtaining an impression of the pedological properties of these materials. These will constitute useful background information for assessing their reclamation potential.

1087. RUTHERFORD, G.K., van LOON, G.W., STEWART, R.B., Queen's Univ. (Geography, Chemistry, Microbiology):
Degredation of some soil profiles in different forest regions in eastern Canada, 1981-84.

Field and laboratory studies of the effects of acid precipitation on Brunisolic soils in the Canada Forest Service research area at Turkey Lake, Sault Sainte Marie and at Montmorency near Quebec City. Soils are being leached by various simulated acid precipitation solutions both in the field and in lysimeters in the laboratory. Leachates from both field and laboratory are being analysed by standard pedological, chemical and microbiological techniques. In the laboratory both long columns representing L to C horizons and short undisturbed columns form L to Bfh; horizons are leached at a considerably greater intensity. Columns will be taken apart after certain periods of time and the soils analysed in considerable detail.

Some columns were sterilised so that changes in microbiological properties during leaching could be determined.

1088. VREEKEN, W.J., MUCHER, H.J., Queen's University (Geography), Univ. Amsterdam:
(Re)deposition of loess in southern Limbourg, The Netherlands, 1978-85.

See:
(Re)Deposition of loess in southern Limbourg, The Netherlands. 3. Field evidence for conditions of deposition of middle and upper silt loam complexes; Earth Surface Processes and Landforms, 1983.

1) Clarify conditions and processes during Saalian and Weichselian loess accumulation; 2) reconstruct geomorphic evolution of successive soil-landscapes between pre-Saalian times and the Present; and 3) evaluate the contribution of micromorphological methodology in the comparison of field data with experimental geomorphological data from process simulation.

1) Field research completed; 2) analytical and mircromorphological analysis partly completed; and 3) three publications completed, and two more to come.

1089. VREEKEN, W.J., PENNOCK, D.J., BARENDREGT, R.W., Queen's Univ. (Geography), Univ. Lethbridge:
Quaternary environments and paleosols in southern Alberta, 1981-84; Ph.D. thesis (Pennock).

See:
Use of the Giddings Coring Machine for paleomagnetic sampling; Canadian Geotechnical J., vol. 20, no. 3, 1983.

1) Reconstruct lateglacial and postglacial geochronology and environmental history, using geological, geomorphological and paleopedological evidence; and 2) evaluate postglacial soil formation in light of results from 1) using buried soils and groundsoils on basis of their distribution, stratigraphical relationships and macromorphological analytical and micromorphological properties.

1) Highwood: Geochronology – A paleomagnetic excursion established within the Sheep River (lacustrine) Formation suggests ice-free conditions after ±24,000 yrs BP. The Bow Valley (till) and Erratics Train (till) Formations are as young as this excursion. Bones from fluvial terrace sediments are being C14 dated. 2) Highwood: Objectives 1) and 2) are approaching completion status in selected parts of the basin. 3) Lethbridge: Reconnaissance for future work has been done.

PRECAMBRIAN/PRÉCAMBRIEN

1090. AITKEN, J.D., Geol. Surv. Can.:
Helikian and Hadrynian stratigraphy Eastern Cordilleran and Interior Platform, 1973-.

See:
Upper Ramparts River (106 G) and Saru Sault Rapids (106 H) map areas, District of Mackenzie; Geol. Surv. Can., Mem. 398, 1982.

1091. BARRETT, T.J., FRALICK, P., MACDONALD, A.J., Univ. Toronto (Geology):
Stratigraphic, sedimentological and geochemical characteristics of two types of banded iron formations in northwestern Ontario, 1982-83.

See:
Stratigraphy and sedimentology of Jurassic bedded cherts overlying ophiolites in the North Apennines, Italy; Sedimentology, vol. 29, p. 353-373, 1982.

This project investigates stratigraphic and sedimentological aspects of two contrasting types of banded iron formation (BIF): 1) Algoma-type BIF containing common intercalations of clastic sediment in addition to bands of chemical sediment; 2) Superior-type BIF consisting solely of chemical sediment. Initial investigations have been carried out on the Algomon-type Geraldton-Beardmore belt in northwestern Ontario. BIF in this area can be traced laterally for at least 100 km as can spatially related greywacke, arkose, conglomerate and volcanic units. The BIF in the Geraldton-Beardmore belt occurs mainly as finely laminated magnetite and/or hematite, with minor jasper facies and limited secondary carbonate. Clastic intercalations within the BIF are generally quartz-rich, range in thickness from a millimetre to a metre, and have been redeposited by turbiditic and debris flow processes. Sedimentary structures in the beds suggest that the BIF was commonly deposited in relatively shallow water, probably above storm wave base. Field relationships indicate that lateral and vertical facies changes between BIF and associated sandstone/conglomerate units can be rapid. The project concentrates on lithofacies analysis and dispersal patterns of clastic material into the chemical sediment basin. Isotopic and trace element studies will be carried out on thin bands of chemical sediment separated layer-by-layer from the BIF. Future field work concentrates on a Superior-type BIF (lower Proterozoic, no associated volcanics) in northwestern Ontario.

STRATIGRAPHY/STRATIGRAPHIE

1092. CAMPBELL, F.H.A., Geol. Surv. Can.:
Geology of the Coronation Gulf area, District of Mackenzie, 1977-.

See:
Stratigraphy of the Rae Group, Coronation Gulf area, Districts of Mackenzie and Franklin; Geol. Surv. Can., Paper 83-1A, p. 43-52, 1983.

1093. CHANDLER, F.W., Geol. Surv. Can.:
Geology of the Helikian sediments and adjacent gneisses, Fury and Hecla Strait area, District of Franklin, 1979-.

1094. EISBACHER, G.H., Geol. Surv. Can.:
Stratigraphy, sedimentation, structure and tectonic setting of the Windermere Supergroup, 1979-.

See:
Devonian-Mississippian sinistral transcurrent faulting along the cratonic margin of western North America: a hypothesis; Geol. Soc. Amer., Geology, vol. 11, no. 1, p. 7-10, 1983.

1095. GOBEIL, A.G., Québec Ministère Énergie et Ressources:
Stratigraphie des roches volcano-sédimentaires d'âge archéen de la région de Chibougamau, Québec, 1979-.

À la suite de l'établissement d'un modèle stratigraphique pour la région immédiate de Chibougamau, réalisation de diverses coupes géologiques le long de la ceinture de Chibougamau-Matagami pour étendre le modèle à la ceinture des roches vertes qui s'étend vers l'ouest.

1096. GOBEIL, A.G., NADEAU, A., TATE, L., ARCHER, P., Québec Ministère Énergie et Ressources:
Project Cu-Zn Cuvier-Barlow, Chibougamau, Québec, 1979–84.

Déterminer de nouvelles cibles d'exploration à partir de forages stratigraphiques réalisés dans la région de Chibougamau.

1097. HENDERSON, J.R., Geol. Surv. Can.:
Geology of the Feas Fold belt (East half), Baffin Island, District of Franklin, 1979–.

1098. HOFFMAN, P.F., Geol. Surv. Can.:
Hepburn batholith, Hepburn Lake map-area, District of Mackenzie, 1977–.

1099. JACKSON, G.D., Geol. Surv. Can.:
Operation Borden, District of Franklin, 1977–.

Seen
Evaporites and folding in the Nechelikian Society Cliffs Formation, northeastern Bylot Island, Arctic Canada; Geol. Surv. Can., Paper 81-1C, p. 35–44, 1981.

1100. LONG, D.G.F., Laurentian Univ. (Geology):
Sedimentology of Precambrian sequences, 1981–85.

Research into Precambrian clastic and carbonate sequences is intended to further the understanding of sedimentary process prior to the development of extensive biogenic influences (other than algae) and provide a stratigraphic and paleogeographic framework for paleo-tectonic reconstructions. Initial work (1982) includes examination of supposed Helikian and Hadrynian strata of the Kennedy Channel and Ella Bay formations in northeastern Ellesmere Island, to provide a basis for correlation of related sequences in Greenland, NWT, and Yukon, and will illucidate the early history of the Franklinian Miogeosyncline. This will be followed by work on associated sequences in the Yukon (1985) and Greenland (1986) if logistically feasible.

Examination of the lower Aphebian, Huronian of the Cobalt Plain (1982–84) is aimed at refining existing models for thick transgressive sand sheets and determining the influence of syndepositional tectonics.

1101. NISBET, E.G., CRAIG, L., JANSSER, B., Univ. Saskatchewan (Geological Sciences):
Studies in Precambrian geology, 1982–84; M.Sc. theses (Craig, Janseer).

Field research by graduate students in northern Saskatchewan. Further studies on thermal development of continental crust.

1102. ROOT, K., SIMONY, P., Univ. Calgary (Geology and Geophysics):
Stratigraphic and structural studies in the Windermere High, eastern Purcell Mountains, British Columbia, 1982–84; M.Sc. thesis (Root).

In an area of the Purcell Mountains, west of Invermere, British Columbia, the Hadrynian to Late Devonian stratigraphic record reveals the persistance of a "high" or local platform. Detailed mapping and stratigraphic analysis delineates a complex fragmentation of the High by growth faults active in Hadrynian and Early Paleozoic time. The discovery of Late Devonian (Frasnian?) shallow water carbonates and fine clastics overlying thinned Hadrynian (Horsethief Creek) strata unconformably, demonstrates that the High was active into Late Devonian time. The Hadrynian and Early Paleozoic faults influence the position of thrust ramps and normal faults formed during the Columbian Orogeny.

1103. SIMARD, A., GÉLINAS, L., LAJOIE, J., FRANCONI, A., Univ. Montréal (Géologie); Québec Ministère Énergie et Ressources:
Stratigraphie de la bande volcano-sédimentaire archéenne Frotet-Evans, Québec, 1978–83; thèse de doctorat (Simard).

Voir:
Lithostratigraphie préliminaire de la partie est de la bande volcano-sédimentaire archéenne Frotet-Evans; Québec Ministère Énergie et Ressources, ET.82-01, 1983.

L'altération hydrothermale des basaltes du lac Troilus: étude préliminaire; ibid., 1983.

La dernière phase de cartographie (phase VI) est prévue pour l'été 1983. Dès l'automne 1983, la rédaction du rapport final va débuter.

1104. TELFORD, P.G., Ontario Geol. Surv.:
Lignite assessment project, 1982–.

1105. WALLACE, H., Ontario Geol. Surv.:
Red Lake synoptic project, Ontario, 1979–83.

Seen
Redlake synoptic project, District of Kenora; Ontario Geol. Surv., Misc. Paper 106, 1982.

Considerable progress has been achieved in unravelling stratigraphic details in the Red Lake belt of northwestern Ontario. Field mapping combined with geophysical data and recent geochronologic studies have allowed long range correlation across this belt, with important implictions for gold metallogeny around this well-established mining camp. New tectono-stratigraphic models of the area are now being developed.

PALEOZOIC/PALÉOZOÏQUE

1106. AITKEN, J.D., Geol. Surv. Can.:
Lower Paleozoic stratigraphy, southern Rocky Mountains, Alberta and British Columbia, 1972–.

1107. BIRON, S., Québec Ministère Énergie et Ressources:
Synthèse stratigraphique et structurale de l'Estrie, Québec, 1983–88.

1108. BLACKWOOD, R.F., Newfoundland Dept. Mines and Energy:
Regional study of the Fachaux Bay area, southern Newfoundland, 1982–84.

To map the westward continuation of the Ordovician Baie D'Espoir Group and its correlatives around the Hermitage Flexure, along the south coast of Newfoundland. The stratigraphic and structural setting of felsic volcanic rocks, host to a number of base metal showings, is of particular importance. This has been established in the Fachaux Bay area. Also, the relationship between these rocks and migmatites, previously interpreted as a basement terrane, is now considered to be a conformable, progressively metamorphosed, sequence.

1109. BOEHNER, R.C., Nova Scotia Dept. Mines and Energy:
Windsor Group project, Loch Lomond Basin, Cape Breton Island, Nova Scotia, 1980–84.

Field mapping and logging of a series of drillhole fences was completed during the 1982 field season. Type and or reference sections were sampled for palynological study and the results are pending a report from M.S. Barss, Atlantic Geoscience Centre.

1110. BOLTON, T.E., Geol. Surv. Can.:
Silurian-Ordovician macrobiostratigraphy of Anticosti Island, Quebec, 1976–.

1111. BRISEBOIS, D., Québec Ministère Énergie et des Ressources:
Géologie de la région de Gaspé, Québec, 1978–84.

Carte lithostratigraphique et structurale de la région de Gaspé: 1978–1982: cartographie; 1983: révision.

1112. CARON, A., ST-JULIEN, P., BIRON, S., Univ. Laval (Géologie), Québec Ministère Énergie et Ressources:
Schistes de Bennett, Québec, 1982–83; thèse de doctorat (Caron).

Carte stratigraphique et structurale de la partie ouest des schistes de Bennett.

1113. CECILE, M.P., Geol. Surv. Can.:
Lower Paleozoic basin-to-platform relationship in the Cordillera, District of Mackenzie-British Columbia-Yukon, 1977–.

1114. CHRISTIE, R.L., Geol. Surv. Can.:
Geological reconnaissance, southeastern margin of Franklinian geosyncline, 1980–.

1115. COOK, D.G., Geol. Surv. Can.:
Boothia Peninsula and Somerset Island (Operation Boothia), District of Franklin, 1976–.

1116. COUSINEAU, P., ST-JULIEN, P., BIRON, S., Univ. Laval (Géologie), Québec Ministère Énergie et Ressources:
Géologie du synclinorium de Saint-Victor, Québec, 1982–85; thèse de doctorat (Cousineau).

Voir:
Géologie d'une partie du quart de la région de Saint-Joseph-de-Beauce; Québec Ministère Énergie et Ressources, DP-82-01, 1982.

Carte lithostratigraphique et structurale du synclinorium de Saint-Victor.

1117. DANNER, W.R., NESTELL, M.K., SADA, K., Univ. British Columbia (Geological Sciences):
Stratigraphy and micropaleontology of the Cache Creek Group in the Marble Canyon and Marble Range area of British Columbia, 1962–.

A continuing study on the stratigraphy and micropaleontology of the Cache Creek Formation in its type area and northward into the Marble Range. Limestones of the sequence range in age from middle Pennsylvanian to Late Triassic. Radiolarian cherts are of similar ages. Some of the cherts are spiculites and both these and the radiolarian cherts are interbedded with the limestones indicating both shallow and deep water deposition. The micropaleo is focusing mainly on the fusulinids and algae and indicate a Tethyan microplate with the fauna living in an equatorial environment. The Tethyan microplate collided with North America in mid-Jurassic time. The study is most detailed in the vicinity of Marble Canyon.

1118. De BROUCKER, G., ST-JULIEN, P., BIRON, S., Univ. Laval (Géologie), Québec Ministère Énergie et Ressources:
Géologie des groupes de Micmac-Maquereau, Gaspésie, Québec, 1982–83; thèse de doctorat (De Broucker).

Carte lithostratigraphique et structurale de la région de Port-Daniel (Gaspésie).

1119. DESROCHERS, A., JAMES, N.P., PETRYK, A.A., Memorial Univ. (Earth Sciences), Québec Ministère Énergie et Ressources:
Lithostratigraphie et sédimentologie des îles de Mingan, Québec, 1982–84; thèse de doctorat (Desrochers).

Etablir une carte des lithofaciès des îles de Mingan. Comparer avec les autres séquences équivalentes des Appalaches. La moitié de la carte a été effectuée en 1986, l'autre moitié sera compléter en 1983. 1982: partie ouest. 1983: partie est.

1120. DIVERGILIO, M., LESPÉRANCE, P.J., PETRYK, A.A., Univ. Montréal (Géologie), Québec Ministère Énergie et Ressources:
Stratigraphie de la formation d'Ellis Bay de l'île d'Anticosti, Québec, 1982-84; thèse de doctorat (Divergilio).

Etablir la lithostratigraphie de la Formation d'Ellis Bay. Etude paléoenvironnementale de la Formation d'Ellis Bay. 1982: Partie ouest de l'île. 1983: Partie est de l'île.

1121. FRITZ, W.H., Geol. Surv. Can.:
Cambrian biostratigraphy of the Canadian Cordillera, 1965-.

Seen:
Vampire Formation, a new Upper Precambrian(?)/Lower Cambrian formation, Mackenzie Mountains, Yukon and Northwest Territories; Geol. Surv. Can., Paper 82-1B, p. 83-92, 1982.

1122. GELDSETZER, H.H.J., Geol. Surv. Can.:
Carboniferous and Triassic strata of Appalachian region, 1976-.

1123. GELDSETZER, H.H.J., Geol. Surv. Can.:
Middle and Upper Devonian rocks of east-central British columbia and west-central Alberta, 1979-.

Seen:
Depositional history of the Devonian succession in the Rocky Mountains southwest of the Peace River arch; Geol. Surv. Can., Paper 82-1C, p. 55-64, 1982.

1124. GLOBENSKY, Y., Québec Ministère Énergie et Ressources:
Rapport géologique sur la région de St-Jean – Béloeil, Québec, 1983-84.

Recartographier la région de St-Jean Béloeil afin d'incorporer cette région dans une carte de compilation des Basses-Terres du Saint-Laurent. Cette carte de compilation est en préparation depuis de nombreuses années.

1125. HOWIE, R.D., Geol. Surv. Can.:
Compilation of geoscientific data in the Upper Paleozoic basins of southeastern Canada, 1971-.

1126. LACHAMBRE, G., BOURQUE, P.A., SKIDMORE, W.B., Univ. Laval (Géologie), Québec Ministère Énergie et Ressources:
Stratigraphie du groupe de Chaleurs, Gaspésie nord-centrale et nord-ouest, Québec, 1981-83; thèse de maîtrise (Lachambre).

1981 – Région Lessops – Lemieux – rapport intérimaire en préparation. 1982 – Région Joffre Faribault – Richard, rapport préliminaire sous presse.

1127. McCABE, H.R., BANNATYNE, B.B., McRITCHIE, W.D., Manitoba Dept. Energy and Mines (Geol. Services Br.):
Stratigraphic and industrial minerals core hole program, southwestern Manitoba, 1969-.

Seen:
High Rock Lake crater structure; Manitoba Dept. Energy and Mines, Mineral Res. Div., Report of Field Activities, 1982.

Stratigraphic mapping and core hole program, ibid.

The continuing core hole program obtained much new data on the complex structural deformation associated with the High Rock Lake crater; data are supportive of a meteorite impact origin for the structure.

Several detailed ground magnetometer profiles were carried out in the High Rock Lake area, to aid in defining the limits of the crater and location of drill holes, and also in the Cranberry Portage area, to determine locations for five core holes drilled to ascertain the source of a strong airborne gradiometer anomaly.

Several geologically complex areas, including the Lake St. Martin crater structure, were outlined for core hole drilling by the Branch, to correlate with and supplement hammer seismic profiles run by the Geological Survey of Canada.

1128. MALO, M., BÉLAND, J., SKIDMORE, W.B., Univ. Montréal (Géologie), Québec Ministère Énergie et Ressources:
Stratigraphie et structure de l'anticlinorium Percé-Matapédia (parti-est), Québec, 1981-84; thèse de doctorat (Malo).

1981 – Région Percé grande rivière – rapport intérimaire sous presse. 1982 – Région au nord de Chandler – rapport préliminaire sous presse.

1129. MAYR, U., Geol. Surv. Can.:
Stratigraphy and correlation of lower Paleozoic subsurface, Arctic Islands, 1973-.

1130. MAYR, U., Geol. Surv. Can.:
Paleozoic stratigraphy of central and southern Ellesmere Island and northern Devon Island, District of Franklin, 1981-.

1131. MEIJER-DREES, N.C., Geol. Surv. Can.:
Middle and Upper Devonian rocks in the subsurface of west-central Alberta, 1981-.

1132. MORROW, D.W., Geol. Surv. Can.:
Stratigraphy, sedimentology and diagenesis of Paleozoic rocks in the Mackenzie Mountains and northern Rocky Mountains, Yukon Territory, 1975-.

Seen:
Interpretation of lead isotope data from zinc-lead mineralization in the northern part of the western Canadian Cordillera; Can. J. Earth Sci., vol. 19, no. 5, p. 1070-1078, 1982.

1133. NASSICHUK, W.W., Geol. Surv. Can.:
Stratigraphy and paleontology of Upper Paleozoic rocks on Ellesmere and Axel Heiberg Islands, District of Franklin, 1968-.

1134. NASSICHUK, W.W., Geol. Surv. Can.:
Carboniferous biostratigraphy in the northern Yukon, British Columbia, and Alaska, 1975-.

1135. NORFORD, B.S., Geol. Surv. Can.:
Ordovician and Silurian biostratigraphy of British Columbia, Alberta, Manitoba, Yukon, Mackenzie and Franklin, 1961-.

1136. NORRIS, A.W., Geol. Surv. Can.:
Devonian biostratigraphy of the northern Yukon Territory and adjacent District of Mackenzie, 1970-.

1137. O'BRIEN, S.J., Newfoundland Dept. Mines and Energy:
Geological evolution of the southwestern Hermitage Flexure, southwestern Newfoundland, 1982-85.

To produce 1:50,000 scale geological maps of the southwestern and south-central portions of the Hermitage Flexure Belt of the Newfoundland Appalachians, a belt underlain by an Ordovician volcano-sedimentary sequence intruded by a variety of mainly pre-Carboniferous granitoid plutons. The major aims include: establishment of the stratigraphy and structural history of the volcano-sedimentary sequence; subdivision of large tracts of deformed and undeformed plutonic rocks including possible basement rocks; establishing the significance of large gabbroid massifs of the region (i.e. ophiolitic vs. intrusive); establishing and understanding of controls of both volcanogenic and granitoid hosted mineralization. The area contains elements of both the Gander and Dunnage tectonostratigraphic zones and should yield important information pertaining to the development and destruction of the Ordovician arcs of Newfoundland.

1138. PEDDER, A.E.H., Geol. Surv. Can.:
Upper Silurian and Devonian biostratigraphy western and northern Canada, 1968-.

Seen:
New Zlichovian (Early Devonian) rugose corals from the Blue Fiord Formation of Ellesmere Island; Geol. Surv. Can., Paper 82-1C, p. 71-82, 1982.

Probable Dalejan (Early Devonian) cystiphyllid corals from Bird Fiord Formation of Ellesmere Island; ibid., p. 83-90, 1982.

Chostophyllum, a new genus of charactophyllid corals from the Middle Devonian of Western Canada; J. Paleontol., vol. 56, no. 3, p. 559-582, 1980.

Stauromatilidae and Stauromatilidae, new genus and family of Upper Silurian and Lower Devonian rugose corals; Geol. Surv. Can., Bull. 332, 1982.

1139. RAESIDE, R.P., Acadia Univ. (Geology):
Stratigraphy, structure and metamorphism of the Cape Breton Highlands, Victoria County, Nova Scotia, 1983-86.

Long-Term Aims: 1) produce 1:50,000 geological maps of the eastern Cape Breton Highlands; 2) define and describe ages and styles of deformation and metamorphic events in Cape Breton Highlands; and 3) identify the role of the Cape Breton Highlands in the development of the Appalachian Orogen.

Short-Term Aims: 1) mapping on a 1:25,000 and 1:10,000 scale in the Ingonish area; and 2) detailed structural analysis and definition of isograds.

1140. RICHARDS, B.C., Geol. Surv. Can.:
Carboniferous stratigraphy and sedimentology of northeastern British Columbia and northwestern Alberta, 1981-.

1141. ROUILLARD, M., LESPÉRANCE, P.J., BRISEBOIS, D., Univ. Montréal (Géologie), Québec Ministère Énergie et Ressources:
Stratigraphie des Calcaires Supérieurs de Gaspé, Gaspésie nord-centrale et nord-ouest, Québec, 1981-83; thèse de doctorat (Rouillard).

1981 – région Larivière – Dorlandus – rapport intérimaire sous presse. 1982 – région Duivière – Richard – rapport préliminaire sous presse.

1142. ST. PETER, C.J., GEMMELL, D.E., New Brunswick Dept. Nat. Res. (Mineral Development Br.):
Economic and stratigraphic assessment of Albert Formation, New Brunswick, 1981-83.

To complete the initiated facies study of the Albert Formation, thereby determining the geographic and geometric configuration of the economically attractive oil shale facies. Thereafter, to assess the grade of the oil shale layers and commence a feasibility study of the applicability of open pit excavations in the higher grade shales. Depending on funding, the second phase of the project may include some drilling to place volume and tonnage figures on recoverable grade shale.

1143. SANFORD, B.V., Geol. Surv. Can.:
Lower Paleozoic geology of Eastern Canada, 1975-.

Seen:
Devonian conodonts and stratigraphy of southwestern Ontario; Geol. Surv. Can., Bull. 332, 1982.

1146. SCHENK, P.E., Dalhousie Univ. (Geology):
Sedimentology and stratigraphy of Lower Paleozoic rocks of Nova Scotia in light of trans-Atlantic correlation, 1972-.

Sees
Guidebook for Avalon and Meguma Zones; Pre-Cand. Field Trip, NATO ASI Regional Tends in Geology of the Appalachian-Caledonian-Hercynian-Mauritanide Orogen, 1982.

Pre-Acadian sedimentary rocks of the Meguma Zone, Nova Scotia – a passive continental magin juxtaposed against a volcanic island arc; Internat. Assoc. Sedimentologists, 11th Congr., Excursion 3B, Field Excursion Guidebook, 1982.

1145. SLIVITZKY, A., STEVENS, R.K., BIRON, S., Memorial Univ. (Earth Sciences), Québec Ministère Énergie et Ressources:
Le cambro-ordovicien du nord-est de la Gaspésie, Québec, 1981-85; thèse de doctorate (Slivitzky).

Carte lithostratigraphique et strucutrale du N-E de la Gaspésie.

1146. SMITH, G.P., STEARN, C.W., McGill Univ. (Geological Sciences):
Stratigraphy and palaeontology of the Lower Devonian formations on southwestern Ellesmere and adjacent islands, Arctic Canada, 1978-83; Ph.D. thesis (Smith).

Sees
The Devonian carbonate-clastic sequence on southwestern Ellesmere Island, Arctic Canada; Can. Soc. Petrol. Geol., Mem. 8, p. 147-154, 1982.

1147. STRUIK, L.C., Geol. Surv. Can.:
Stratigraphy and tectonics of the western margin of the southern Omineca Belt, British Columbia, 1982-.

1148. THOMPSON, R.I., Geol. Surv. Can.:
Structure and stratigraphy of Paleozoic and lower Mesozoic rocks in Halfway River map-area, northeastern British Columbia, 1973-.

1149. THORSTEINSSON, R., Geol. Surv. Can.:
Structure and stratigraphy of Devon Island, District of Franklin, 1976-.

1150. WEBB, T.C., NOBLE, J.P.A., van de POLL, H.W., Univ. New Brunswick (Geology):
Depositional history of the Armstrong Brook Formation: Armstrong Brook-Pointe Rochette area, northern New Brunswick, 1973-83; M.Sc. thesis (Webb).

1151. YOLE, R.W., IRVING, E., BROWN, D., WEST, T., Carleton Univ. (Geology):
Stratigraphy, structure and displacement history (Paleozoic-Mesozoic) of Vancouver Island, British Columbia, 1969-85; M.Sc. theses (Brown, West).

Preliminary results from Jurassic rocks of Vancouver Island have yielded a paleolatitude of 21, not significantly different from that for the late Triassic obtained earlier. Preliminary structural and stratigraphic data indicate polyphase deformation for the lower part of the Sicker Group in the Salmon River – Maple Bay area. These studies are to be extended and amplified to determine whether any major break in the Paleozoic succession can be documented. Further geological and paleomagnetic studies are to be carried out to complete the analysis of Paleozoic-Mesozoic sequences and displacement history of Vancouver Island in relation to other parts of the Insular Belt.

1152. ZODROW, E.L., College of Cape Breton (Geology):
Phytostratigraphy of Sydney Coalfield, Cape Breton Island, Nova Scotia, 1973-.

Sees
Recent paleobotanical studies, Sydney Coalfield, Cape Breton Island, Nova Scotia, Canada; Third North American Paleontol. Conv., vol. 2, p. 593-598, 1982.

Studies on North American pecopterids. IV. Diversity and stratigraphic occurrence in Sydney Coalfield, Nova Scotia; ibid., vol. 1, p. 193-198, 1982.

Macrofossil plant data, including that of W.A. Bell and J.W. Dawson, of Sydney Coalfield are being stratigraphically reinterpreted. The base of the Westphalian D is put in the roof of the Tracy seam, and that of the Westphalian D/Stephanian in an interval of the Harbour and Lloyd Cove seams. Two mid-Westphalian floral change-over are also recognized, a lower one at the Mullins seam and an upper one at the Emery seam. These change-overs can be correlated with coalfields in South Wales.

MESOZOIC/MÉSOZOÏQUE

1153. ASCOLI, P., Geol. Surv. Can.:
Biostratigraphic zonation (Formanifera-Ostracoda) of the Mesozoic and Cenozoic rocks of the Atlantic Shelf, 1971-.

1154. BARRETT, T.J., LEGGETT, J.K., ROBERTSON, A.H., FRIEDRICHSEN, H., Univ. Toronto (Geology):
Stratigraphic and geochemical aspects of two unusual ophiolite complexes: East Liguria, Italy and Ballantrae, Scotland, 1981-84.

Sees
Review of stratigraphic aspects of the ophiolitic rocks and pelagic sediments of the Vara Complex, North Apennines, Italy; Ofioliti, vol. 7, p. 3-43, 1982.

In East Liguria, Italian North Apennines, and at Ballantrae, Southwest Scotland, ophiolites occur which, in terms of their stratigraphic relations are far removed from classical ophiolite complexes and our concept of normal oceanic crust. Our present interpretation of the East Liguria ophilite is that it is an early form of oceanic crust formed immediately after continental breakup, possibly including some transform fault zone rocks. The Ballantrae ophiolite, on the other hand, is viewed mainly as a volcanic edifice, either an aseismic ridge or seamount, with only very limited amounts of typical mid-ocean ridge basalts (MORB).

In the case of East Liguria, the stable isotopic data for the basalts suggest significant $\delta^{18}O$-enrichment relative to fresh MORB due to secondary low-temperature smectitic phases. Serpentinization is estimated to have occurred at temperatures of some 130 to 260°C, and to have been influenced by a meteoric water component. Quartz/calcite veins cutting the ophiolitic rocks are inferred to have formed at temperatures of 77 to 149°C, apparently after the highest sub-seafloor temperatures had been attained by the host rocks.

1155. CHRISTOPHER, J.E., Saskatchewan Geol. Surv.:
Lower Cretaceous Mannville Group of Saskatchewan, 1976-84.

1156. DIXON, J., Geol. Surv. Can.:
Geology of the Beaufort-Mackenzie Basin, 1979-.

1157. EMBRY, A.F., Geol. Surv. Can.:
Mesozoic stratigraphy and basin analysis of the Sverdrup Basin, Arctic Archipelago, 1975-.

1158. FITZPATRICK, M., SIMONY, P.S., Univ. Calgary (Geology and Geophysics):
Stratigraphy and structure of Rossland arc, southeastern British Columbia, 1982-84; M.Sc. thesis (Fritzpatrick).

The Early Jurassic Rossland Group is comprised of the Sinemurian Archibald Formation and the overlying Sinemurian (and younger?) Elise Formation. The Archibald Formation consists of siltstone and argillite with conglomerate horizons including a persistent conglomeratic coquina. The Elise Formation consists of volcanic sandstone, volcanic conglomerate, sedimentary and volcanic breccia as well as some andesitic flows and minor intrusives masses. The proportion of sedimentary to volcanic rocks is probably higher than implied in previous published descriptions. The clasts in the conglomerates are dominantly porphyritic andesite but limestone, chert, siltstone and granitic gneiss have also been found.

The aim is to delineate the various rock units, distinguish the different sedimentary and volcanic facies and to attempt a reconstruction of the environment and tectonic setting.

1159. GIBSON, D.W., Geol. Surv. Can.:
Stratigraphic and sedimentological studies of Lower Cretaceous rocks, Rocky Mountain Foothills and Front Ranges, Alberta and British Columbia, 1975-.

1160. GIBSON, D.W., Geol. Surv. Can.:
Stratigraphy and sedimentology of the Lower Cretaceous Gething Formation, Rocky Mountain Foothills, Alberta and British Columbia, 1979-.

1161. JANSA, L.F., Geol. Surv. Can.:
Reconnaissance field study of the Mesozoic sequences outcropping on the Iberian Peninsula, 1977-.

1162. POULTON, T.P., Geol. Surv. Can.:
Jurassic biostratigraphy of selected areas of western and Arctic Canada, 1976-.

Sees
Stratigraphy and microfossils of the Jurassic Bug Creek Group of northern Richardson Mountains, northern Yukon and adjacent Northwest Territories; Geol. Surv. Can., Bull. 325, 1982.

Recent discoveries of Jurassic fossils in the Lower Schist Division of central Yukon; Geol. Surv. Can., Paper 82-1C, p. 91-94, 1982.

1163. PRICE, L.L., Geol. Surv. Can.:
Geological observations at shafts of potash mines, Saskatchewan, 1964-.

1164. STOTT, D.F., Geol. Surv. Can.:
Jurassic and Cretaceous Minnes Group, Alberta and British Columbia, 1978-.

1165. STOTT, D.F., Geol. Surv. Can.:
Syntheses of Mesozoic and Cenozoic rocks of eastern Cordillera and Plains, 1981-.

Sees
Lower Cretaceous Fort St. John Group and Upper Cretaceous Dunvegan Formation of the Foothills and Plains of Alberta, British Columbia, District of Mackenzie and Yukon Territory; Geol. Surv. Can., Bull. 328, 1982.

1166. TEMPELMAN-KLUIT, D.J., Geol. Surv. Can.:
Stratigraphy, structure and metallogeny of the northern part of the Intermontane Belt (Whitehorse trough) in the Canadian Cordillera, 1977-.

1167. TIPPER, H.W., Geol. Surv. Can.:
Biostratigraphic study of Mesozoic rocks in the Intermontane and Insular Belts of the Canadian Cordillera, 1975-.

Sees
Offset of an upper Pliensbachian geographic zonation in the North American Cordillera by transcurrent movement; Can. J. Earth Sci., vol. 18, no. 12, p. 1788-1792, 1981.

1168. WADE, J.A., Geol. Surv. Can.:
Regional subsurface geology of Mesozoic and Cenozoic rocks of the Atlantic continental margins, 1972-.

CENOZOIC/CÉNOZOÏQUE

1169. CHURCH, B.N., EVANS, S., British Columbia Ministry Energy, Mines, Petrol. Res.:
Tertiary stratigraphy and resource potential in south-central British Columbia, 1977-.

A study of Tertiary outliers to better define their energy and metal resources in southern and central British Columbia.

1170. MATHEWS, W.H., ROUSE, G.E., Univ. British Columbia (Geological Sciences):
Tertiary stratigraphy and palynology, Gang Ranch-Big Bar area, 1980-.

1171. PROUDFOOT, D.N., MORAN, S.R., RUTTER, N.W., Alberta Research Council (Geol. Surv.), Univ. Alberta (Geology):
Quaternary geology and stratigraphy of the Medicine Hat – Lethbridge area, Alberta, 1978-83; Ph.D. thesis (Proudfoot).

Conclusions indicate that three individual till sheets can be recognized and correlated between the relatively closely spaced sections in the Medicine Hat area on the basis of their physical and mineralogical properties, and can be traced as far west as Bow Island.

Three and possibly four individual till sheets have been recognized in the Taber area, along with one of the major interglacial or interstadial fluvial events recognized at Medicine Hat. However, reliable correlation with the sequence at Medicine Hat based on physical properties has not yet been completed. It has been determined that one of the tills found in the Taber area is not present at Kipp, just west of Lethbridge.

An interesting development over the last two years involves the recognition and mapping of glacial sediment facies, including several diamicton types. Work during 1982-83 has refined the stratigraphic framework using sedimentary facies relationships in glacial, fluvial and lacustrine sediments.

1172. YORATH, C.J., Geol. Surv. Can.:
The Canadian-Pacific continental margin, 1977-.

STRUCTURAL GEOLOGY/TECTONICS/GÉOLOGIE STRUCTURALE/TECTONIQUE

ALBERTA/ALBERTA

1173. BEATTIE, E.T., SPRATT, D.A., Univ. Calgary (Geology and Geophysics):
The effect of facies variation on the style of deformation, Ram Range, Alberta, 1982-84; M.Sc. thesis (Beattie).

To investigate the effect of facies variation in the Devonian Fairholme Group on the style of deformation in the vicinity of the North Saskatchewan and Ram Rivers, Alberta. In this area there are well documented facies changes from generally platform and reef carbonates in the south, to a fine clastic basin facies in the north. Field observations made in both facies in the hangingwall of the McConnell Thrust indicate that the mechanism of shortening changes from concentric folding and brittle fracture in the vicinity of the Bow River, to similar folding with incipient cleavage development in the off-reef facies. Although the facies change is thought to be confined to the Fairholme Group, it apparently affects the style of deformation in the overlying Palliser, Banff, and Rundle Group, and possibly in the underlying Cambrian formations. In this study we will describe these structural variations geometrically through detailed field mapping, and quantitatively through field measurements and strain analysis.

1174. CHARLESWORTH, H.A.K., Univ. Alberta (Geology):
Structure of coal-bearing strata in the Rocky Mountain Foothills of west-central Alberta.

Seen

Duplexes and northeast-dipping thrusts in coal-bearing strata, Outer Foothills, west-central Alberta; Geol. Soc. Amer., Abstracts with programs, 1982.

At Coal Valley, in the outer Rocky Mountain Foothills of west-central Alberta, Upper Cretaceous and Paleocene coal-bearing strata are cut by the longitudinal, southwest-dipping Coal Valley and northeast-dipping Starco thrusts and by the transverse Roco fault. Northwest of the Roco fault, which originated as a lateral ramp, the Coal Valley thrust follows the Mynheer seam, whereas to the southwest it parallels the overlying Val D'Or seam. In places the thrust is replaced by a duplex whose floor and roof thrusts follow the bottom and top of the seams. The thickness of coal in the duplexes is up to 20 times normal. The Mynheer and Val D'Or duplexes occur near the tip of a northeasterly tapering wedge, bound above and below by the Starco and Coal Valley thrusts, that moved outwards more than 10 km with respect to adjacent strata.

1175. LANGENBERG, C.W., Alberta Research Council (Geol. Surv.):
Structural geology of coal measures, foothills of Alberta, 1981-83.

Generation of basic geological information for use in exploration, development and reclamation purposes, thus facilitating access to a noteable energy resource.

1176. MAUREL, L.E., SPRATT, D.A., Univ. Calgary (Geology and Geophysics):
Structure and stratigraphy of the Barrier Mountain overthrust sheet, southwestern Alberta, 1982-86; Ph.D. thesis (Maurel).

Barrier Mountain thrust sheet, a salient of the Front Ranges on an oil-bearing anticlinal structure of the Alberta Foothills, displays a complex assemblage of thrust faults repeating formations which are Cambrian to Mississippian in age. The delineation of the McConnell Thrust is not shown consistently on the various earlier maps due to changes in both the stratigraphic nomenclature and the positioning of folds and faults. Structural analysis of this salient has not been undertaken in spite of previous studies of other salients along the McConnell thrust. We propose to establish the geometric relationships between faults and the sequence of faulting using newly developed principals, especially those of Boyer and Elliott (1982). Mapping will be done at a scale of 1:10,000. More precise geometric analysis will be concentrated in key areas such as tip and branch points along the traces of the imbricate thrusts. Microtectonic analysis, computer data processing, and observation of thin sections showing associated microfracturing, strain, dissolution and recrystallization, will be the main methods used to refine the chronology of events, both folding and faulting, affecting the numerous imbricate sheets. Confusion still persists in the nomenclature of stratigraphic formations in the area because of the cut-off and shearing of units produced by intense faulting, and because of facies changes within the formations. A meticulous stratigraphic analysis of the formations defined by the measuring and correlation of lithologic sections must be undertaken before any kind of structural interpretation can be made. The results will be shown in balanced cross sections, 'in series' cross sections along the whole range, and longitudinal sections; they will be supported by hangingwall sequence diagrams, stratigraphic separation diagrams, and palinspastic maps.

1177. RIGGERT, V.L., SPRATT, D.A., Univ. Calgary (Geology and Geophysics):
The geometry and mechanical development of the Heart Mountain thrust stack, Exshaw, Alberta, 1982-83; M.Sc. thesis (Riggert).

The Exshaw Thrust, one of the major thrusts in the Southern Canadian Rockies Front Ranges, is linear for most of its 70 km map trace. The map trace style changes markedly at Heart Mountain (Exshaw, Alberta) where a small thrust stack has formed, repeating the Mississipian Livingstone Formation at least twice. Mechanisms for emplacement and reasons for localization and development of such a stack have not been studied here or in any other thrust belt. Objectives are to integrate rigorous field work and meticulous geometrical analysis into a coherent account of the material behaviour of the rock and the mechanical development of the Heart Mountain structure. To accomplish these goals, we have mapped the stratigraphic sequence and structure at scales of 1:10,000 and 1:5,000, and are in the process of preparing structure contour maps, palinspastic maps and cross sections, and hangingwall sequence diagrams. Compilation of the results of these methods, along with field relationships of ductile and brittle deformation, will be used to determine the sequence of deformational events.

There are many problems in defining the lithology and thickness of each unit in the study area. Facies changes occur within the units and sampling sites given in the literature are often 3 to 100 km away from Heart Mountain. An accurate and detailed description is imperative for any structural interpretation. Delineation of the geometry of the Heart Mountain thrust stack holds a key to understanding the development of this stack and similar stacks in the Front Ranges of the Southern Canadian Rockies.

1178. SPRATT, D.A., Univ. Calgary (Geology and Geophysics):
Deformation mechanics associated with the growth and emplacement of thrust sheets, 1980-85.

Preliminary work in the Foreland Thrust Belt of the southern Canadian Rockies indicates that the creation of the fault surface is a problem of ductile or semi-brittle fracturing; investigation of the areas around the tips of well exposed thrust faults aids in the description of the mechanics of fracture. Emplacement of a thrust sheet sets up a finite strain field within the sheet; correlation of this finite strain with the

physical mechanisms which caused it is now providing a guide to the overall stress – strain rate response of the sheet. Additional strain within a thrust sheet is the result of folding as an underlying sheet moves up a ramp. Completed field work indicates that during the evolution of a thrust belt, different deformation mechanisms occur in different regions of a thrust sheet. We find: zones of intense fracturing, ductile deformation zones, pressure solution cleavage in fold hinge regions, and vein filling in tensile regions. By separating out the effects due to each stage of development, we can begin to understand how the porosity and permeability of the rock can be altered locally by deformation.

1179. WIGHTMAN, D.M., Alberta Research Council (Geol. Surv.):
Cold Lake oil sands, Alberta, 1980-84.

See:
Stratigraphic traps in channel sandstones in the Upper Mannville (Albian) of east-central Alberta: discussion; Can. Petrol. Geol. Bull., vol. 29, p. 622-625, 1982.

Sedimentology and stratigraphy of the Upper Mannville over selected areas in east-central Alberta (abstract); AAPG Ann. Convention, Calgary, Alberta, 1982.

Sedimentology and stratigraphy of the Upper Mannville over selected areas in east-central Alberta (abstract); Internat. Assoc. Sedimentologists, 11th Congr., 1982.

BRITISH COLUMBIA/ COLOMBIE-BRITANNIQUE

1180. CAMPBELL, R.B., Geol. Surv. Can.:
Geology of the Caribou Mountains, British Columbia, 1968-.

1181. DECHESNE, R.G., SIMONY, P.S., GHENT, E.D., Univ. Calgary (Geology and Geophysics):
Metamorphism and structural evolution of the southern Caribou Mountains and the adjacent Monashee Mountains, British Columbia, 1982-84; M.Sc. thesis (Dechesne).

Mapping of the northern flank of the Shuswap Metamorphic Complex, as defined by the presence of sillimanite, continues, in 1983. The area is multiply deformed with the earlier, premetamorphic, deformations producing tight folds and a later phase creating small open-style folds. All folds are approximately coaxial. We are attempting to determine the motion on the North Thompson Normal Fault from the matching of markers and structures across the fault. Based on differences in metamorphic mineral assemblages across the fault, the vertical motion is presumed to be about 6 km.

1182. GREENWOOD, H.J., Univ. British Columbia (Geological Sciences):
Structural transition between Lower Cambrian Mural Formation and Hadrynian Caribou Group, British Columbia, 1981-83.

To elucidate the transition from the known stratigraphy in the Black Stuart syncline to the strongly deformed and metamorphosed rocks of the Caribou Group. Mapping to date shows that the Caribou Group is separated from the overlying Lower Cambrian Mural formation by a zone of mylonite, and that the Caribou Group has enjoyed at least one more episode of intense folding than the overlying rocks.

1183. LEECH, G.B., Geol. Surv. Can.:
Geological survey of NTS 82 J W½ (Kananaskis Lakes, W½), British Columbia, 1982-.

1184. OLLERENSHAW, N.C., Geol. Surv. Can.:
Structural analysis of the Fernie Basin, British Columbia, 1975-.

1185. TAYLOR, G.C., Geol. Surv. Can.:
Structural and stratigraphic studies of northeast British Columbia, 1981-.

1186. THOMPSON, R.I., Geol. Surv. Can.:
Detailed geological study of selected areas within the Foothills and Rocky Mountains belts of the Monlman Pass map area – with emphasis on the structure, 1978-.

MANITOBA/MANITOBA

1187. BRISBIN, W.C., Univ. Manitoba (Earth Sciences):
Fracture dilation during emplacement of pegmatite dikes, Bird River area, Manitoba, 1981-83.

Pegmatitic granites and pegmatites of the Winnipeg River District occur in sets of fractures which are younger than the most recent metamorphic event in the area. The fractures have been dilated by the intrusion of pegmatite fluids at pressures in excess of the ambient stresses tending to keep the fractures closed. The dilation of fractures with preferred orientations has been observed in the field. The preferred orientations can be interpreted as being due to changes in stress conditions with depth at the time of pegmatite emplacement. The combination of lithostatic pressure and a horizontal deviatoric stress in the upper lithosphere results in a critical depth below which vertical fractures dilate preferentially and above which horizontal fractures dilate preferentially. At the critical depth fractures with all orientation show dilation.

NEW BRUNSWICK/ NOUVEAU-BRUNSWICK

1188. STRINGER, P., Univ. New Brunswick (Geology):
Relation of cleavage to folding in the Appalachian-Caledonian orogenic belt, 1973-85.

1189. van STAAL, C.R., WILLIAMS, P.F., Univ. New Brunswick (Geology):
Deformation and metamorphism of the region around Brunswick no 6 and Brunswick no. 12, Bathurst area, New Brunswick, 1980-84; Ph.D. thesis (van Staal).

A structural history has been determined. Work so far suggests that economic limits are related to fold interference patterns or large sheath fold.

1190. WILLIAMS, P.F., Univ. New Brunswick (Geology):
Deformation mechanisms and tectonic processes, 1980-.

Deformed rocks are being studied with a view to better understanding the processes involved in their deformation. The ultimate goal is a better understanding of the processes involved in large scale tectonics.

NEWFOUNDLAND/LABRADOR/ TERRE-NEUVE/LABRADOR

1191. QUINLAN, G.M., Memorial Univ. (Earth Sciences):
Geodynamic models of sedimentary basin development on the Grand Banks of Newfoundland, 1983-.

To attain a better understanding of the dynamic processes responsible for formation of the sedimentary basins on the Grand Banks. The subsidence histories of the basins can be deduced from the biostratigraphic records of deep exploratory wells and will provide the primary data set for geodynamic models. In particular it is important to know the extent of thermal control on basin subsidence and the extent to which the thermal histories of the basins can be reconstructed from their subsidence histories. This is because of the direct relationship between hydrocarbon maturation and the thermal history of sediments.

1192. van der PLUIJM, B., WILLIAMS, P.F., Univ. New Brunswick (Geology):
Deformational and metamorphic history of New World Island, Newfoundland, 1981-84; Ph.D. thesis (van der Pluijm).

Results so far show that the overturning is only local; the sequence in fact is not homoclinal but tightly folded. Early thrust faults have been identified and most faults on existing maps have been shown to be late.

1193. WARDLE, R.J., RYAN, A.B., Newfoundland Dept. Mines and Energy:
Nain-Churchill Province cross-section, Nachvak Fiord, northern Labrador, 1982-83.

Project to date has involved examination of the eastern part of the Nain-Churchill Province boundary zone. Work in 1983 will extend this west towards the interior regions of the Churchill Province and examine the extent to which structurally reworked Archean crust extends into the Churchill Province.

1194. WILLIAMS, H., Memorial Univ. (Earth Sciences):
Suspect terranes and accretionary history of the Appalachian-Caledonides Orogen, 1982-83.

See:
Suspect terranes and accretionary history of the Appalachain Orogen; Geology, vol. 10, p. 530-536, 1982.

The North American connection, or the Grenvillian continental crust that separated from eastern North America during the initiation of the Appalachian orogenic cycle, is poorly defined within the present orogen. A variety of terranes occur outboard of the North American miogeocline, all structurally uncoupled and therefore suspect. Stratigraphic analysis indicates that Appalachian accretion progressed from the miogeocline outward. The boundaries of the earliest accreted western terranes are marked by melange and ophiolite complexes. Later boundaries between eastern terranes are steep mylonitic zones and brittle faults. Accretionary events, defined by stratigraphic analysis, correspond to times of major deformation, plutonism, and metamorphism in the history of the orogen.

Present plans are to expand the scope of this analysis to include the entire Appalachian/Caledonides orogen. A terrane map for the Appalachian/Caledonides Orogen is presently being compiled in cooperation with the Appalachian/Caledonides IGCP Project 27.

NORTHWEST TERRITORIES/TERRITOIRES DU NORD-OUEST

1195. FYSON, W.K., Univ. Ottawa (Geology):
Structural patterns in metamorphic rocks, 1970-.

1196. HENDERSON, J.R., Geol. Surv. Can.:
Geology of the Penrhyn Fold Belt, Melville Peninsula, District of Franklin, 1976-.

1197. HILDEBRAND, R.S., Geol. Surv. Can.:
Hottah Terrane, District of Mackenzie, 1982-.

See:
Geology and U-Pb geochronology of part of the Leith Peninsula and Rivière Grandin map areas, District of Mackenzie; Geol. Surv. Can., Paper 83-1A, p. 329-362, 1983.

1198. HOFFMAN, P.F., Geol. Surv. Can.:
Externides of Wopmay Orogen, District of Mackenzie, 1981-.

See:
The externides of Wopmay Orogen, Point Lake and Kikerk Lake map areas, District of Mackenzie; Geol. Surv. Can., Paper 83-1A, p. 429-435, 1983.

1199. HURDLE, E., FYSON, W.K., Univ. Ottawa (Geology):
Stratigraphy, structure and metamorphism of the Yellowknife Supergroup, Clan Lake, Northwest Territories, 1981-83; M.Sc. thesis (Hurdle).

1200. OKULITCH, A.V., Geol. Surv. Can.:
Stratigraphy, structure and tectonics, Inuition Fold Belt, Ellesmere Island, District of Franklin, 1979-.

1201. ST-ONGE, M.R., Geol. Surv. Can.:
Thrust-fold belt of Wopmay Orogen – internal zone, District of Mackenzie, 1981-.

See:
Geology, Redrock Lake and eastern Calder River map areas, District of Mackenzie, the central Wopmay Orogen (early Proterozoics), Bear Province, and the western Archean Slave Province; Geol. Surv. Can., Paper 83-1A, p. 147-152, 1983.

1202. WILLIAMS, G.K., Geol. Surv. Can.:
Northern basin analysis program: Redstone and Great Slave Lake map-areas, District of Mackenzie, 1971-.

NOVA SCOTIA/NOUVELLE-ÉCOSSE

1203. STEVENS, G.R., Acadia Univ. (Geology):
Digital Landsat imagery analysis of regional fracture patterns applied to mineral exploration, 1981-83.

70% complete: integration of ground- and aerial geophysical (company) data with Landsat-derived linear structure, central Nova Scotia Region. Delineation of circular (diapyric) structures in Devonian granite. Scale used is 1:50 000 thematic subscenes. Technique already extended to other terrains, notable Labrador Trough and in Republic of Korea.

ONTARIO/ONTARIO

1204. CULSHAW, N.G., FYSON, W.K., Univ. Ottawa (Geology):
Geology, structure and microfabrics of Grenville rocks in the Cardiff area, Ontario, 1976-83; Ph.D. thesis (Culshaw).

1205. HOLM, P.E., Univ. Windsor (Geology):
Fold generations and cleavages in the Bancroft-Madoc area, Ontario, 1981-84.

Detailed structural mapping in the Central Metasedimentary Belt of the Grenville Structural Province between Bancroft and Madoc, Ontario has been undertaken. Three generations of folds are clearly recognizable; isoclinal F_1 folds; tight, reclined F_2 folds with variable plunge; and open, vertical F_3 folds. Transposition structures are commonly associated with the F_1 and F_2 fold generations.

Detailed study of the various types and generations of cleavages is also being conducted. Of particular interest is the development of the S_2 cleavage in relationship to the nature of S_1, lithology, and metamorphic grade. In addition, the petrology and geochemistry of the deformed dikes and metavolcanic units is also being determined.

1206. THIVIERGE, R.H., FYSON, W.K., Univ. Ottawa (Geology):
Structure and metamorphism of Grenville gneiss, Bangor Township, Ontario, 1980-84; M.Sc. thesis (Thivierge).

1207. TREVAIL, R., BOOTH-HORST, R., Ontario Geol. Surv.:
Compilation of faults in southwestern Ontario, 1982-84.

To compile faults in Southern Ontario as derived from stratigraphic information from oil and gas wells, and relate these to oil and gas and metallic minerals explorations.

QUÉBEC

1208. BABINEAU, J., FRANCONI, A., HUBERT, C., Québec Ministère Énergie et Ressources:
Tectonique de la région de Lamotte-Malartic, Abitibi, Québec, 1981-83; thèse de doctorat (Babineau).

1209. DAIGNEAULT, R., FRANCONI, A., Québec Ministère Énergie et Ressources:
Synthèse géologique et structurale de la région de Chibougamau, Quebec, 1982-85.

Ce rapport se veut une synthèse des travaux exécutés dans la région de Chibougamau. L'accent est mis sur une interprétation structurale adéquate qui permettra de contrôler la lithostratigraphie de la région.

1210. LAMOTHE, D., FRANCONI, A., PICARD, C., Univ. Grenoble (ou Lyon), France, Québec Ministère Énergie et Ressources:
Cartographie de la ceinture de Cape Smith-Maricourt, Nouveau-Québec, 1983-.

Cartographie à l'échelle 1:50,000 de la moitié ouest de la ceinture; étude de la structure et de la pétrologie – spécialement des sills ultramafiques – et de leur impact avec les indices métallifères connues.

1211. Van der LEEDEN, J., FYSON, W.K., Univ. Ottawa (Geology):
Nature of Grenville Front zone in western Québec, 1976-83; Ph.D. thesis (Van der Leeden).

YUKON TERRITORY/TERRITOIRE DU YUKON

1212. COOK, D.G., Geol. Surv. Can.:
Structural studies in the Mackenzie Arc, Franklin Mountains and Colville Hills, Yukon and District of Mackenzie, 1973-.

1213. NORRIS, D.K., Geol. Surv. Can.:
Structural geology of northern Yukon Territory and northwestern District of Mackenzie, 1969-.

1214. TEMPELMAN-KLUIT, D.J., Geol. Surv. Can.:
Stratigraphy, structure and metallogeny of Pelly Mountains, and Yukon Plateau, Yukon Territory, 1973-.

GENERAL/GÉNÉRALITÉS

1215. BRISBIN, W.C., RUSSELL, J., Univ. Manitoba (Earth Sciences):
Systematic fracturing within the North Menan Butte Tuff Ring, Idaho, 1982-83.

Four sets of fractures are systematically related to the geometric form of the north Menan Tuff Ring. These fracture sets fall into two age categories; an early set which is perussive and members of which show progressive offset (downthrown) towards the rim of the ring; three late sets that are extensional in character and arranged both tangentially and radially. The early set is interpreted as due to deflation, degassing or compaction of the tephra pile, the late sets are accounted for by either thermal or dehydration contraction.

1216. KING, L.H., Geol. Surv. Can.:
Bedrock and surficial geology, Grand Banks, 1973-80.

1217. LONCAREVIC, B.D., Geol. Surv. Can.:
The tectonics of the intersection of a mid-ocean ridge and a transform fault, 1982-.

1218. RANALLI, G., MORAVEC, A., FADAIE, K., CHERNIS, P., Carleton Univ. (Geology):
Role of rheology in geodynamics, 1981-84; M.Sc. theses (Moravec, Chernis), Ph.D. thesis (Fadaie).

See:
Deformation maps in grain-size stress space as a tool to investigate mantle rheology; Phys. Earth Planet. Interiors, vol. 29, p. 42-50, 1982.

The long-term objectives are the determination of the rheology of lithosphere and mantle, and the modelling of selected geodynamic processes on the basis of realistic rheological equations.

1) Variations of effective viscosity across the mantle transiton zone and in the lower mantle. On the basis of recent results of the pressure-, temperature-, and phase change-dependence of creep activation parameters, an improved estimate of the effective viscosity of the lower mantle and of its effect on the depth extent of mantle flow will be given.

2) Role of transient creep in mantle flow. By examination and extrapolation of fundamental transient creep equations, deformation maps including transient creep effects will be constructed, and the possible role of transient creep in small-strain mantle deformation evaluated.

3) Continuum-mechanics modelling of the geotectonic evolution of foreland belts. A pure plasticity solution for the velocity and slip-line fields in a model foreland wedge will be compared with data from the Rocky Mountain Foreland Belt to test the geodynamic history of foreland belts.

4) Effects of shear zones in intra-lithospheric decoupling. Available analysis on the thermo-mechanical properties of lithospheric shear zones will be extended to include the effects of grain size reduction and hydrolytic weakening; their importance will be assessed by comparison with observations.

1219. SOUTHER, J.G., Geol. Surv. Can.:
Study of the Cenozoic evolution of the western Cordillera, 1977-.

1220. SRIVASTAVA, S.P., Geol. Surv. Can.:
Comparative studies of the continental margins of the Labrador Sea and of the North Atlantic, 1978-.

See:
Volcanic rocks in the Labrador Sea and environs and their relation to the evolution of the Labrador Sea; Geol. Surv. Can., Paper 82-1B, p. 7-20, 1982.

1221. STEVENS, G.R., Acadia Univ. (Geology):
General purpose, interactive computer-drawn stereographic diagrams, 1981-83.

Revision and enhancement of authors' earlier (1970) "egg" general purpose stereonet program, for field, microscopic, and X-ray (texture, fabric) diffractometry. Provides evaluative routines, several user options, rotations, etc., suitable for academic, institutional, and commercial users at users own terminal, from central computer. 75-80% complete.

1222. STEVENS, G.R., Acadia Univ. (Geology):
Scale model anlaysis, 1982-83.

During application of simple shear in scale clay model deformation, one member of conjugate pair set locks after given amount of rotation,

and is suppianted by generation of entirely new shear set of same polarity at a lesser angle to principal stress axis. Project investigates this phenomenon, seeks to explain and to apply to natural cases of three conjugate joint sets.

1223. STEVENS, G.R., KANG, P.C., Acadia Univ. (Geology), Korea Inst. Energy and Resources:
Emplacement patterns of Cenozoic and Mesozoic granite diapyrs, and regional fracture patterns of South Korea, via digital Landsat Image Analysis, 1982-83.

Numerous circular and elliptical diapyric features have been delineated in central South Korea, correlated with Cenozoic and Mesozoic granite masses, up to tens of kilometers diameter. These identified via digital Landsat image analysis, initially at small scale 1:1 000 000 to be extended via thematic subscenes to 1:100 000 and 1:50 000. Correlation of regional linear network with tectonic episodes, mineral distribution patterns.

1224. WHITE, J.C., Univ. New Brunswick (Geology):
Transmission electron microscopy studies of rock deformation, 1982-.

To characterize the microstructures of deformed rocks using transmission electron microscopy (TEM) and relate these microstructures to the grain-scale deformation mechanisms. Knowledge of these fundamental micro-mechanisms is basic to interpretation of the dynamics of large-scale geological deformations.

VOLCANOLOGY/VOLCANOLOGIE

1225. BENNETT, G., INNES, D.G., Ontario Geol. Surv.:
Huronian volcanism, Sault Ste. Marie-Sudbury area, Ontario, 1976-83.

1226. BOSTOCK, H.H., Geol. Surv. Can.:
Volcanic rocks of the Appalachian region, 1973-.

1227. CARTER, M.W., THURSTON, P.C., Ontario Geol. Surv.:
Schreiber-Terrace Bay area, Ontario, 1979-83.

The Early Precambrian rocks comprise a metavolcanic-metasedimentary sequence intruded by metagabbroic and granitic-syenitic plutons. Metavolcanic rocks predominate among the supracrustal rocks and consist mainly of iron-rich tholeiitic subaqueous flows, which have been metamorphosed to greenschist and amphibolite rank regional metamorphism. Felsic intrusive rocks comprise granodiorite and granite and quartz monzodiorite, quartz monzonite and syenitic rocks.

Middle to Late Precambrian rocks comprise diabase and lamprophyre dikes which trend northerly and westerly, sedimentary rocks of the Animikie Group and mafic sills intruding the sediments.

Mineral deposits comprise gold, copper-molybdenum and copper-lead-zinc base-metal mineralization.

1228. CHURCH, B.N., SEUSSER, U., British Columbia Ministry Energy, Mines, Petrol. Res.:
Plateau and valley basalts and rhyolites of the Okanagan region, British Columbia, 1980-.

Several outliers of Miocene basalt have been recently delineated in the Okanagan Highlands south and southeast of Vernon, British Columbia. The total area underlain by lavas and breccias is about 200 km^2. These volcanic rocks, which range in age from 14.9 to 20.4 Ma, were deposited locally on placer-bearing gravels in valleys and more extensively on a plateau terrain of crystalline rocks. The basalt formation, divided locally into three members by interbedded volcaniclastics, has a maximum thickness of about 340 metres comprising more than 15 consecutive lava flows. Preliminary magnetic studies using a fluxgage magnetometer shows that the gravels are overlain by 'reversed' valley filling basalts of the oldest member. The younger plateau-forming basalts in the succession have 'normal' polarity, however, magnetic vectors show a marked range in azimuth and plunge suggesting some magnetic excursion or transition.

Two occurrences of Miocene rhyolite are noted in the Okanagan remote from the main basalt centres. These are a glassy rhyolite dyke on Mt. Law near Westbank and the Olalla Rhyolite west of Twin Lakes in the Penticton Tertiary outlier. The latter occurrence is a small centre of rhyolite breccia and obsidian with a subjacent protoclastic dyke.

The Lambly Creek basalt of mid-Pleistocene age (0.742 ± 0.115 Ma) is the youngest known volcanic deposit in the Okanagan region. Remnants of several successive lava flows are exposed intermittently for a distance of aobut 25 kilometres along Lambly Creek between a magnetic anomaly believed to be the source area north of Lambly Lake and a lava bench on the west bank of Okanagan Lake near Kelowna. The geography and setting of the Lambly Creek basalt is reminiscent of the Aiyansh lava flow north of terrace and the older valley basalts of southern British Columbia.

1229. HAMILTON, T.S., Geol. Surv. Can.:
Volcanic rocks of the Insular Belt and adjacent deep ocean, British Columbia, 1982-.

1230. HOCQ, M., FRANCONI, A., Québec Ministère Énergie et Ressources:
Projet Joutel-Quévillon, Abitibi, Québec, 1980-83.

La cartographie de 1983 terminera la première phase du projet de Joutel-Quévillon. Elle s'appliquera à la carte de la Rivière Gale (cantons de Dalet, Mazarin, Céloron, Guyenne, Languedoc).

1231. IMREH, L.I., Univ. Dolomieu à grenoble (France), Québec Ministère Énergie et Ressources:
Cadre volcanologique, lithochimique et structural de la zone favorable à la minéralisation Cu-Zn-Ag-fère des mines Manitou et Louvem (région de Val d'Or, Québec), 1983-86.

Le projet devrait préciser à l'échelle locale l'evolution et la nature du volcanisme type arc insulaire dans une zone minière. La place de la minéralisation Cu-Zn-Ag-fère occupee au sein de l'édifice volcanique sera ensuite définie. Finalement, le projet devrait permettre, par analogie, la délimitation d'autres zones locales favorables à la minéralisation.

1232. THURSTON, P.C., AYRES, L.D., EDWARDS, G.R., GÉLINAS, L., LUDDEN, J.N., Ontario Geol. Surv., Univ. Manitoba (Geol. Sv), Univ. Montreal (Géologie):
Was Archean volcanism bimodal?, 1981-.

Examination of major types of Archean volcanism. The study has shown the bimodal character of Archean volcanism through field evidence in metavolcanic and metasedimentary rocks trace and major element geochemistry. Consequences of this model for Archean tectonism, mineral deposits, models of volcanic processes and rates at magma production are examined.

1233. TROWELL, N.F., Ontario Geol. Surv.:
Black River – Matheson area, Ontario, 1982-86.

Specific reference to regional stratigraphy and elucidation of relationship of mineral occurrence to stratigraphy and structure, with special attention being given to determining nature at Destor Procupine Fault.

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Pleistocene history of Sable Island, Nova Scotia, $11,000.00.
Zentilli, M. (Geology)
Geological controls of tin-bearing zones in the Dominque-Plymouth area, Yarmouth County, Nova Scotia, $6,100.00.

St. Mary's University

Pe-Piper, G. (Geology)
Mesozoic-Cenozoic volcanicity of the eastern North American continental margin, $3,400.00.

NEWFOUNDLAND

Memorial University of Newfoundland

Barnes, C.R. (Geology)
Conodont biostratigraphy and paleoecology of the Cow Head Group (Cambro-Ordovician), western Newfoundland, $6,000.00.
Hay, A.E. (Physics)
Acoustic remote sensing and the sedimentology of Arctic fjords, $8,500.00.
Macpherson, J. (Geography)
Palynological investigations, Newfoundland, $7,500.00.
Rivers, T. (Geology)
Geological and geochronological investigations in the Grenville Front region, coast of Labrador, $8,000.00.
Williams, H. (Geology)
Geology of Pasadena map area (12H/4) with possible extensions northward (Lomond, 12H/5), $13,000.00.
Wright, J.A. (Physics)
Marine geothermal measurements offshore Eastern Canada, $10,000.00.

Department of Environment Canada, Water Resources Research Support Program, Research Agreements 1982-83/Ministère des Environnement Canada, Programme de subvention à la recherche sur les ressources en eau, conventions de recherche 1982-83

University of British Columbia

Clarke, G.K.C. (Geophysics and Astronomy)
Glacier beds: their relationship to ice dynamics, glacier hydrology and erosion, $12,000.00.

University of Saskatchewan

Gray, D.M. (Hydrology)
Infiltration into frozen and partially frozen soils, $18,000.00.

University of Waterloo

Barker, J.F. (Earth Sciences)
Transport of hazardous organic solutes and metals in groundwaters at a special waste disposal site, $18,000.00.

Polar Continental Shelf Project Field Support Non-Governmental Activities 1982-83/Aide de l'étude du Plateau continental polaire en faveur d'activités non gouvernementales pour 1982-83

BRITISH COLUMBIA

University of British Columbia

Slaymaker, O.
Geomorphic processes, Horton River, Northwest Territories.

ALBERTA

University of Alberta

England, J.
Glacial geomorphology, northern Ellesmere Island, District of Franklin.
Jones, B.
Silurian-Devonian paleontology, Ellesmere, Devon, Bathurst and Melville Islands, District of Franklin.

ONTARIO

McMaster University

McCann, S.B.
Coastal processes, Alexandra Fiord, Cape Herschel, Ellesmere Island, District of Franklin.
Rice, R.J.
Sedimentology, southern Ellesmere Island, District of Franklin.
Woo, M.-K.
Hydrology, Mould Bay, Resolute, Eureka, District of Franklin.

University of Ottawa

Dixon, O.A.
Paleontology and sedimentology, Baumann Fiord, Ellesmere Island, District of Franklin.
French, H.M.
Geomorphic processes, Banks Island, District of Franklin.

Royal Ontario Museum

von Bitter, P.H.
Carboniferous micropaleontology, Tanquary Fiord, Ellesmere Island, District of Franklin.

Sir Sandford Fleming College

Watts, S.H.
Bedrock geology, Ellesmere Island, District of Franklin.

University of Toronto

Ritchie, J.C.
Quaternary paleobotany, Banks Island, western Victoria Island, District of Franklin.
Schwerdtner, W.H. and Miall, A.
Stratigraphy, eastern Axel Heiberg Island, District of Franklin.

University of Western Ontario

Lenz, A.C.
Silurian-Devonian paleontology, Lowther and Bathurst Islands, District of Franklin.

U.S.A.

Milwaukee Public Museum

West, R.M.
Paleontology, Arctic Islands, District of Franklin.

University of Washington

Washburn, A.L.
Periglacial features, Resolute, Cornwallis Island, District of Franklin.

JAPAN

Hokkaido University

Nakawo, M.
Ice coring, southern Ellesmere Island, District of Franklin.

Ontario Geological Survey, Geoscience Research Grants 1982-83/
Commission géologique de l'Ontario subventions de recherche en sciences de la terre pour 1982-83

Brock University

Brand, U.
Source rock geochemistry of Pleistocene tills of southern Ontario, $20,840.00.

Carleton University

Bell, K.
"Latter-stage decay products" of ^{222}Rn use in radioactive waste management, $24,000.00.
Watkinson, D.H.
Platinum group element potential in alkaline rocks of northwestern Ontario, $13,622.00.

McMaster University

Crocket, J.H.
Genesis of Precambrian iron formations – links with base and precious metal mineralization, $45, 000.00.

University of Toronto

Campbell, I.H.
Rare earth elements in acid volcanics, $29,100.00.
Edwards, R.N.
Cross-hole magnetometric resistivity, $28,400.00.
Kenney, T.C.
Field investigation of factors controlling changes of groundwater pressure in clay slopes, $7,300.00.
Miall, A.D.
Rock geochemistry as a placer exploration, $12,819.00.
Naldrett, A.J.
Platinum group elements in layered intrusions, $20,100.00. Contamination and the genesis of the Sudbury ores, $14,000.00.
Strangway, D.W.
Surface electromagnetic mapping in selected positions of Northern Ontario, $57,500.00.
van Bitter, P.H.
Chert resources of southern Ontario: their petrographic, palynologic and stratigraphic characteristics, $9,500.00.
Wicks, F.J.
Mineralogy and geochemistry of the chrysotile asbestos deposits of Ontario, $25,025.00.

University of Waterloo

Barker, J.F.
Source, correlation and thermal maturation history of hydrocarbon mineral deposits of southern Ontario, $23,730.00.
Farvolden, R.M.
Subsurface Quaternary stratigraphy using borehole geophysics, $30,817.00.
Gale, J.
Impact of groundwater on surface and subsurface mining activities in Niagara Escarpment area, $12,877.00.
Greenhouse, J.P.
Gravity survey of the Upper Dundas buried valley, $4,380.00.

University of Western Ontario

Edgar, A.D.
The petrology, geochemistry and economic potential of the Nipissing Gabbro, $11,223.00.
Fyfe, W.S.
Stratigraphy and geochemistry of Northern Ontario carbonaceous deposits: Onakawana lignites and James Bay peats, $48,500.00.
Mereu, R.F.
A micro-earthquake survey of Gobles Oil Field area of southwestern Ontario, $22,000.00.

University of Windsor

Hudec, P.P.
Petrographic number re-evaluation, $13,950.00.
Symons, D.T.
Analysis of aeromagnetic anomalies over Algoman-type iron formations, $23,790.00.

Natural Sciences and Engineering Research Council Canada Earth Science Operating Grants 1982-83/Conseil de recherches en sciences naturelles et en génie Canada sciences de la terre subventions pour dépenses courantes 1982-83

NAME DEPARTMENT UNIVERSITY	
Achab, A. INRS-Pétrole Québec-INRS	Chitinozoaires de l'Ordovicien inférieur et moyen du Québec et de l'Est du Canada
Adamowski, K. Civil Engineering Ottawa	Stochastic modelling of the hydrologic cycle
Aldridge, K.D. Physics York	Laboratory studies in geophysical fluid dynamics
Allard, M. Géographie Laval	Les environnements côtiers de l'Hudsonie
Allen, J.M. Geology Toronto	1) Experimental and field studies in metamorphic & igneous petrology 2) Petrology of Ca-Al-rich inclusions in the Allende meteorite
Anderson, G.M. Geology Toronto	Metasomatic and ore-forming solutions
Anderson, M.M. Biology Memorial	Contributions to palaeontology and stratigraphy, mainly Newfoundland
Appleyard, E.C. Earth Sciences Waterloo	Element mobilities in metasomatic rocks
Arabrust, G.A. Geology Ottawa	Genesis of hydrothermal gold deposits associated with felsic intrusions
Armstrong, R.L. Geological Sciences British Columbia	Geochronometry of Cordilleran rocks and isotope studies of crustal evolution
Ayres, L.D. Earth Sciences Manitoba	Physical volcanology, stratigraphy, and geochemistry of Precambrian and Early Paleozoic volcanoes
Baadsgaard, H. Geology Alberta	Isotope geology of: Archean polymetamorphic rocks, pyroclastic beds, uranium deposits and salt beds
Bachinski, D.J. Geology New Brunswick	Field and laboratory studies in economic geology
Baer, A.J. Science Ottawa	1) Structural studies in the Grenville Province 2) Evolution of Proterozoic orogenes
Bailey, R.C. Physics/Geology Toronto	Geomagnetic sounding of the crust and upper mantle/Uranium exploration
Ballivy, G. Génie civil Sherbrooke	Comportement des coulis d'étanchéité et de scellement dans le roc: ancrages, pieux, barrages
Barbeau, C. Chimie Laval	Disponibilité des métaux traces dans les sédiments aqueux
Barker, J.F. Earth Sciences Waterloo	Aspects of organic and bio-geochemistry in the groundwater environment
Barnes, C.R. Geology Memorial	Conodont taxonomy, biostratigraphy, paleoecology, and biogeography
Barnes, M.A. Geological Sciences British Columbia	Organic geochemistry of Recent sediments, southwestern British Columbia
Barnes, W.C. Geological Sciences British Columbia	Sedimentology and organic geochemistry of lake sediments and peats of southwestern British Columbia
Barr, S.M. Geology Acadia	Petrology, petrogenesis, and economic potential of igneous rocks from southern Nova Scotia, Cape Breton Island and Thailand
Bayliss, P. Geology & Geophys. Calgary	Applied crystallographic-mineralogy
Bazinet, R. Génie minéral Ecole Polytech.	Magnétotellurique haute fréquence

NAME DEPARTMENT UNIVERSITY	
Beales,F.W. Geology Toronto	Stratigraphy and stratabound mineral deposits
Beaumont,C. Oceanography Dalhousie	Earth rheology and geodynamics
Beck,A.E. Geophysics Western Ontario	Investigation of pure and applied geothermal problems
Bell,K. Geology Carleton	Isotope geochemistry of carbonatites
Berrais,P. Géographie Qué-Montréal	Impacts de l'utilisation du sol sur les différentes composantes du bilan hydrologiques (quantité-qualité)
Beswick,A.E. Geology Laurentian	Determination of the primary geochemical characteristics of Precambrian Volcanism and nature of the early upper mantle
Bland,C.J. Physics Calgary	Investigations in disequilibrium in uraniferrous soil, rock and water
Blenkinsop,J. Geology Carleton	Pb-Sr and Sm-Nd investigations of the crust and upper mantle
Borradaile,G.J. Geology Lakehead	Structural and metamorphic geology with emphasis on Archean rocks of NW Ontario
Bouchard,M.A. Géologie Montréal	Pétrographie et morphologie du till, région de Chibougamau-Lac Mistassini, Québec
Bourque,P. Géologie Laval	Analyse paléo-environnementale des ensembles à carbonates du Siluro-Dévonien du Bassin de Gaspésie
Bovis,M.J. Geography British Columbia	Slope movement in southwest British Columbia
Bowen,A.J. Oceanography Dalhousie	Dynamics of waves, currents and sediments
Boyd,P. Geology Dalhousie	Coastal sediment dispersal and Holocene Bay structure, Eastern Nova Scotia
Brand,U. Geological Sciences Brock	Carbonate diagenesis and metals and hydrocarbon exploration geochemistry
Brookes,I.A. Geography York	Sea level & glacial history, W. Newfoundland: Geomorphological & micropaleontological approaches
Brookfield,M.E. Land Resource Sc Guelph	Studies of recent and ancient desert deposits
Brooks,C. Geology Montréal	Evolution of the Precambrian Shield of Canada as determined by geochemical, isotopic and geochronologic analysis
Broughton,P.S. Agricult. Eng. Macdonald Coll.	An analysis of the effects of drainage works on downstream flood peaks
Brown,A.C. Génie minéral Ecole Polytech.	1) Etude métallogénique des gisements stratiformes de métaux non-ferreux 2) Metallogenic studies of stratiform non-ferrous metal deposits
Brown,E.L. Geology Carleton	Structural investigations in the Canadian Cordillera
Brown,E.P. Earth Sciences Waterloo	A study of uranium isotope disequilibrium in the Pre-Cambrian environment
Bryan,R.B. Geography Toronto	Erodibility of soils and erosion processes in laboratory and badland areas
Burwash,R.A. Geology Alberta	Uranium and thorium in crystalline rocks of the western shield
Bustin,R.M. Geological Sciences British Columbia	Structure, sedimentology, and petrology of Cretaceous and Tertiary coal measures in Western Canada
Byrne,P.M. Civil Engineering British Columbia	Analytical methods in soil & soil-structure interaction problems
Caldwell,W.G.E. Geological Sciences Saskatchewan	Biostratigraphic studies in the cretaceous system of Western Canada
Calon,T.J. Geology Memorial	Structural studies of ophiolites and associated rocks
Calvert,S.E. Oceanography British Columbia	Geochemistry of trace metals in recent marine sediments
Cameron,E.M. Geology Acadia	Evolution, paleoecology and depth distribution of fossil marine microbial oncoliths
Campbell,F.A. Geology & Geophys. Calgary	Geochemistry, mineralogy, and isotope studies of rocks and ores
Campbell,I.A. Geography Alberta	Runoff, sediment yields and partial area contributions in badlands
Campbell,I.H. Earth/Planet. Sci. Toronto	Activity coefficients in silicate liquids
Campbell,I.H. Earth/Planet. Sci. Toronto	* Principal investigator J.Gittins(Toronto)
Cannon,W.H. Physics York	Applications of long baseline interferometry to geodesy, geophysics, and planetary dynamics
Carmichael,C.M. Geophysics Western Ontario	Geomagnetism
Carmichael,D.M. Geological Sciences Queen's	Metamorphic studies in Canada
Carroll,R.L. Redpath Museum McGill	Evolution and functional anatomy of Paleozoic and Early Mesozoic reptiles
Cerny,P. Earth Sciences Manitoba	Mineralogy, petrology, and genesis of granitic pegmatites
Chao,G.Y. Geology Carleton	1) Mineralogy of the nepheline syenite, Mont St.-Hilaire, Québec 2) Phase relations in the system Pt-Pd-Te-Sb
Chapman,C.H. Physics Toronto	Seismic body wave theory
Charlesworth,H.A.K. Geology Alberta	Structural study of coal-bearing and adjacent strata,Rocky Mountain Foothills, central Alberta
Chatterton,B.D.E. Geology Alberta	Taxonomic, paleoecologic, biostratigraphic and biogeographic studies of Paleozoic faunas of western and northern Canada, with concentration on conodonts and trilobites
Cherry,J.A. Earth Sciences Waterloo	Migration of contaminants and environmental isotopes in shallow groundwater flow systems

Chesworth,W. Land Resource Sc Guelph	Weathering of igneous rocks	
Church,M.A. Geography British Columbia	Studies of the hydraulics of alluvial rivers	
Church,M.P. Geology Western Ontario	Comparative evolution of ophiolite-bearing Proterozoic and Paleozoic orogenic systems	
Churcher,C.S. Zoology Toronto	Quaternary mammalian faunas, especially of Canada and Africa	
Clark,A.H. Geological Sciences Queen's	Origin and delimitation of metallogenetic provinces at convergent lithosphere plate boundaries	
Clark,G.S. Earth Sciences Manitoba	Rubidium-strontium geochronology of Archean orthogneiss and middle Proterozoic plutonism, Churchill Province, northern Manitoba	
Clarke,D.B. Geology Dalhousie	Petrogenesis of igneous rocks: 1) Granites 2) Kimberlites and peridotites 3) Basic rocks	
Clarke,G.K.C. Geophys./Astron. British Columbia	Glaciology: field study, theory and instrumentation	
Clarke,W.B. Physics McMaster	Investigations of isotope patterns in nature	
Clowes,R.M. Geophys./Astron. British Columbia	Reflection/refraction seismology on land and at sea for crustal/upper mantle investigations	
Copley,J.G. Geography Trent	Palaeoclimate and global tectonics	
Collins,D.N. Zoology Toronto	Distribution, composition and inter-relationships of Eurasian Shale faunas	
Cooke,R.C. Oceanography Dalhousie	Reactions of gaseous, dissolved and particulate carbon in the sea	
Copper,P. Geology Laurentian	Paleoecology, evolution and morphology of Ordovician to Devonian atrypoid brachiopods; ecological succession in reefs	
Crocket,J.H. Geology McMaster	Applications of geochemistry to mineral deposit genesis	
Crossley,D.J. Mining/Metal. Eng. McGill	1) Physics of the earth's interior 2) Exploration geophysics	
Cruden,D.M. Geology Alberta	Stability of natural slopes in rock	
Cuming,G.L. Physics Alberta	Systematics of PB isotope variations in ores and rocks - crustal seismic reflection and refraction studies	
Curran,J.H. Civil Engineering Toronto	Constitutive equations for porous geologic materials	
D'Anglejan,B.F. Marine Sci. Centre McGill	Benthic boundary layer sedimentation processes in estuaries	
Dalrymple,R.W. Geological Sciences Queen's	Sediment dynamics of Cobequid Bay and Sable Island Bank	
David,M. Génie minéral Ecole Polytech.	Développements géostatistiques pour l'inventaire de réserves	
David,P.P. Geology Montréal	Study of eolian deposits in Canada	
Davidson-Arnott,R.G.D. Geography Guelph	Beach and nearshore processes - erosion and sedimentation	
Davies,J.F. Geology Laurentian	Intensity of carbonate alteration in basalts and ultramafic rocks	
Davis,A.M. Geography Toronto	Palynology, paleoecology and disturbance of peatlands in Newfoundland	
Deutsch,E.R. Physics Memorial	Rock magnetism and geological structure in the Newfoundland region	
Dickinson,W.W. Engineering Guelph	Erosion and sedimentation modelling	
Dimroth,E. Sc. appliquées Québec-Chicoutimi	1) Volcanologie physique et sédimentologie d'une ceinture volcano-sédimentaire Archéenne 2) Evolution magmato-tectonique de la Province Grenville au Saguenay-Lac-St-Jean	
Dionne,J. Géographie Laval	Evolution des rives du Saint-Laurent: estuaire et golfe (secteur du Québec)	
Dixon,J.M. Geological Sciences Queen's	Centrifuge modelling of gravity-driven geologic structures and tectonic consequences of ridge subduction	
Dixon,O.A. Geology Ottawa	Ordovician-Silurian invertebrate fossils and sedimentary facies	
Doig,P.		
Geological Sciences McGill	Geological applications of isotopic analysis	
Donaldson,J.A. Geology Carleton	Comparative studies of Precambrian sedimentary rocks	
Donnay,G.		
Geological Sciences McGill	Relation of physical and chemical properties to crystal structure	
Donn,W.L. Physics Victoria	Geomagnetic variations and electromagnetic modelling	
Dostal,J. Geology Saint Mary's	Geochemical studies of some rocks	
Drake,J.J. Geography McMaster	Long-term significance of present geomorphic and hydrologic process rates	
Dreimanis,A. Geology Western Ontario	Glaciogenic deposits and stratigraphy of last glaciation in southern part of Canada	
Dudas,M.J. Soil Science Alberta	1) Biogeochemistry of arsenic in soils developed on acid shale 2) Seasonal dynamics in the natural abundance of mercury in soil	
Dunlop,D.J. Physics Toronto	Rock magnetism and paleomagnetism of continental and submarine rocks and synthetic analogs	
Durard,M. Sciences de la terre Québec-Montréal	La géologie dans les aménagements urbains	
Dusseault,M.B. Earth Sciences Waterloo	Geomechanics of in situ processes	
Edgar,A.D. Geology Western Ontario	Geochemistry and petrology of igneous rocks with particular reference to the mantle	
Edmund,A.G. Geology Toronto	Osteology, stratigraphic relationships and systematic revision of giant armadillos and ground sloths: Study of certain Pleistocene Pelidae	

Edwards,R.N. Physics Toronto	Electromagnetic exploration at sea with controlled sources	
Eisenstein,Z. Civil Engineering Alberta	1) Application of constitutive models to analysis of earth structures 2) Behaviour of tunnels in soil 3) Stress-strain behaviour of oil sands	
Elias,P.J. Earth Sciences Manitoba	Upper Ordovician solitary rugose corals of western and northern North America	
Ellis,R.M. Geophys./Astron. British Columbia	Seismic crustal and array studies	
Elrick,D.E. Land Resource Sc Guelph	Transport phenomena in natural porous media	
Emery,J.J. Civil Engineering Toronto	Simulation of time-dependent problems in geotechnology	
Emery,K.J. Oceanography British Columbia	Monthly surveys of the upper waters in the Central Strait of Georgia	
England,J. Geography Alberta	Quaternary glaciation, glacio-isostasy and paleoclimatic change, Northern Ellesmere Island	
Evans,L.J. Land Resource Sc Guelph	Phenolic acids and podzolization	
Evans,M.E. Physics Alberta	Quaternary paleomagnetism of Western Canada and archeomagnetic investigations	
Evans,R.D. Environmental Stud. Trent	Lake sediments as indicators of anthropogenic lead deposition	
Evensen,N.M. Geology Toronto	Analysis and modeling of isotopic variations in geologic systems	
Fahey,B.D. Geography Guelph	Hydration and salt crystallization as rock weathering mechanisms in cold climates	
Fahraeus,L.E. Geology Memorial	Conodont-ophorid paleobiology, ordovician chrono- and biostratigraphy, and Lower Carboniferous ostracodes from south-western Newfoundland	
Farquhar,R.M. Physics Toronto	Lead isotope ratio variations	
Farrar,E. Geology Queen's	Cordilleran geochronology and the kinematic and tectonic consequences of ridge subduction	
Farvolden,R.N. Earth Sciences Waterloo	Groundwater flow in a stratified reservoir under pumping stress	
Fawcett,J.J. Geology Toronto	Field based and experimental studies in igneous and metamorphic petrology	
Fawcett,J.J. Geology Toronto	* Principal investigator J.Gittins(Toronto)	
Feininger,T. Geology Laval	Comparative petrology and tectonic history of the Quebec Appalachians and the Ecuadorian Andes	
Fellenius,B.H. Civil Engineering Ottawa	The use of new tools and methods in geotechnical field investigations	
Ferguson,K.B. Earth Sciences Manitoba	Crystal-chemical and petrogenetic studies of the rock-forming feldspars and other minerals	
Finn,W.D. Soil Dynamics British Columbia	Behaviour of ground and structures under wave and earthquake loading, moving boundary problems, pollution dispersal	
Fitzgibbon,J.E. Geography Guelph	An experimental study of the effect of litter on the water balance and runoff production	
Fleet,M.E.L. Geology Western Ontario	Crystal chemical and geochemical studies on earth materials	
Fletcher,W.K. Geology British Columbia	Development and utilization of regional geochemical techniques	
Flint,J.J. Geological Sciences Brock	Fluvial morphology and sediment transport in armoured streams	
Ford,D.C. Geography McMaster	1) Groundwater flow and cavern genesis in soluble rocks 2) Quaternary dating & palaeothermometry of calcite speleothem 3) Karst studies in Canada	
Fox,P.C. Geology/Zoology Alberta	Late Cretaceous and Early Tertiary tetrapods from western Canada	
Francis,D. Geological Sciences McGill	Origin and evolution of basic magmas in the upper mantle	
Frape,S.K. Earth Sciences Waterloo		
Fredlund,D.G. Civil Engineering Saskatchewan	Engineering behavior of expansive soils	
Freeze,R.A. Geological Sciences British Columbia	Groundwater in geological processes	
French,H.M. Geology/Geography Ottawa	Geomorphic and permafrost studies, Banks Island and northern interior Yukon	
Frind,E.O. Earth Sciences Waterloo	Mathematical modelling of flow and transport in hydrogeologic systems	
Fritz,P. Earth Sciences Waterloo	Environmental isotopes in the hydrosphere and freshwater sediments for hydrogeologic and paleoclimatic investigations	
Fryer,B.J. Geology Memorial	Igneous and sedimentary geochemistry of the Precambrian and the geochronology of Newfoundland	
Fyfe,W.S. Geology Western Ontario	Chemical transport processes in geological fluids	
Fyson,W.K. Geology Ottawa	Structural patterns in metamorphic rocks	
Gale,J.E. Earth Sciences Waterloo	Factors controlling the movement of fluids through fractured argillaceous and crystalline rocks	
Gale,J.E. Earth Sciences Memorial	Factors controlling the movement of fluids through fractured argillaceous and crystalline rocks	
Gardner,J.S. Geography Waterloo	Episodic fluvial and debrisflow erosion on mountain slopes	
Garland,G.D. Physics Toronto	Thermal and electrical properties of the earth	
Garrett,C.J.R. Oceanography Dalhousie	Physical oceanography	
Gaskill,H.S. Mathematics Memorial	Sea ice and iceberg motion	
Galinas,L. Géologie Montréal	Géochimie et pétrographie des espilements volcaniques de l'Archéen en relation avec les gisements de sulfures massifs	
Gourte,R.A. Géographie Ottawa	Palynostratigraphie et variations climatiques tardiglaciaires et postglaciaires	

Ghent,E.D.
Geology & Geophys.
Calgary
Geochemical and petrologic study of metamorphism and diagenesis

Gibling,M.R.
Geology
Dalhousie
Coal, oil shale and hydrocarbon resources of Atlantic Canada

Gibson,I.L.
Earth Sciences
Waterloo
Petrological and ore-forming processes in extensional regimes

Gilbert,R.
Geography
Queen's
Glaciomarine sedimentary processes in Arctic fiords

Gill,D.F.
Génie minéral
Ecole Polytech.
Le poinçonnement des roches en place

Gillham,R.W.
Earth Sciences
Waterloo
Implications of the capillary fringe in the hydraulic and geochemical interactions of groundwater and surface water

Gittins,J.
Geology
Toronto
Petrogenesis of alkalic rocks and carbonatites, related ores and the underlying mantle

Gittins,J.
Geology
Toronto
Magmatic evolution and the history of continental breakup in the North Atlantic region - with J.J.Fawcett,J.C.Rucklidge, T.H.Campbell(Toronto)

Godwin,C.I.
Geology
British Columbia
Metal and rare earth element zonation in baritic stratiform and volcanogenic deposits, Canadian Cordillera

Goodchild,M.F.
Geography
Western Ontario
Generalization and error in cartography and geographical data processing

Goodwin,A.M.
Geology
Toronto
Archean volcanic petrogenesis and early crustal growth

Gough,D.I.
Physics
Alberta
Magnetometer array studies and paleomagnetism

Gravenor,C.P.
Geology
Windsor
Environment of deposition of ancient glacial deposits

Gray,D.M.
Agricult. Eng.
Saskatchewan
Simulation of hydrological processes

Gray,J.
Physics
Alberta
The use of stable isotope ratios of organic materials in determining past climate variations

Gray,J.T.
Geography
Montréal
Permafrost studies & geothermal modelling in Northern Quebec & Gaspésie

Greenhouse,J.P.
Earth Sciences
Waterloo
Geophysical mapping of contaminant plumes

Greenwood,B.
Geography
Toronto
Coastal hydrodynamics and sedimentation

Greenwood,H.J.
Geological Sciences
British Columbia
Geological phase equilibrium studies

Guha,J.
Sciences de la terre
Qué-Chicoutimi
Rôle des fluides mobilisateurs dans les zones filoniens et porphyres Archéens

Hajnal,Z.
Geological Sciences
Saskatchewan
1) Seismic investigation of deep seated structures in Saskatchewan 2) Seismic investigation of Precambrian contact zones

Hall,D.H.
Earth Sciences
Manitoba
Rock magnetism, regional magnetic anomalies, and explosion seismology in synthesis of crust mantle evolution

Hall,J.M.
Geology
Dalhousie
The nature, structure and history of oceanic crust through drilling, geological and geophysical investigations

Hall,R.L.
Geology & Geophys.
Calgary
Lithostratigraphy and biostratigraphy of the Fernie Formation (Jurassic), Alberta

Halls,H.C.
Geology
Toronto
Paleomagnetism of Precambrian rocks

Hanes,J.A.
Geological Sciences
Queen's
Cooling history of orogens by thermochronometric and petrologic studies

Hare,F.K.
Geography
Toronto
Coupled modelling of climate, ocean and cryosphere

Harris,S.A.
Geography
Calgary
Ecology dynamics and distribution of permafrost and associated landforms in the Cordillera and of shelf ice on the Ward Hunt ice shelf

Hay,A.E.
Physics
Memorial
Coastal and continental shelf oceanography

Hay,J.E.
Geography
British Columbia
Determination of the radiance distribution for the sky hemisphere using radiometric and photometric techniques

Hayatsu,A.
Geophysics
Western Ontario
Study of initial argon by K-Ar isochron method

Helmstaedt,H.
Geological Sciences
Queen's
Fabrics of metamorphic rocks, tectonic setting of mineral deposits, xenoliths from kimberlites

Hendershot,W.H.
Geography
Montréal
Genesis and classification of cryosols

Hendry,M.P.
Geological Sciences
Saskatchewan
Studies in clastic sedimentology

Héroux,Y.
INRS-Géores.
Québec-INRS
Relations entre l'évolution thermique des hétérogènes et la géologie structurale des Appalaches du Québec

Hesse,P.P.
Geological Sciences
McGill
Modern and ancient continental margin sedimentation (diagenesis, processes and environments of deposition, tectonic setting)

Hickin,E.J.
Geography
Simon Fraser
The character of river-channel migration rates in western Canada

Hill,A.R.
Geography
York
Nitrate-nitrogen flux and cycling in rivers

Hillaire-Marcel,C.
Sciences de la terre
Qué-Montréal
Paléoenvironnements isotopiques continentaux et paléoclimats

Hills,L.V.
Geology & Geophys.
Calgary
Palynology, clastic sedimentology and Quaternary research

Hiscott,R.N.
Geology
Memorial
Sedimentation along ancient continental margins

Hodgson,C.J.
Geology
Queen's
Metallogenic studies of Canadian ore-bearing environments

Hodych,J.P.
Physics/Geology
Memorial
Physics of rock magnetism emphasizing stress effects; paleomagnetism of Appalachian Nfld.

Hofmann,H.J.
Géologie
Montréal
Precambrian and lower Paleozoic paleontology and stratigraphy

Bogarth,D.D.
Geology
Ottawa
Petrogenesis of certain alkalic rocks and carbonatites

Bolm,P.T.
Geology
Windsor
Fold generations, cleavages, and tectonic history of the Bancroft-Maloc area, Ontario

Bopkins,J.C.
Geology & Geophys.
Calgary
Sedimentation and diagenesis of Devonian hydrocarbon-bearing sandstones

Boward,K.W.F.
Physical Science
Toronto
Minor and trace constituents of groundwaters and their use as indicators of groundwater origins, groundwater movement & possible aquifer evolution

Bowarth,P.J.
Geography
McMaster
Development and applications of Landsat analytic methodology for the physical environment

Bron,F.
Physics
Alberta
Numerical modelling of seismic waves in structurally complicated media

Buang,C.H.
Geology
Windsor
Analytical methods in geochemistry

Buntley,D.A.
Oceanography
Dalhousie
Nearshore and boundary layer dynamics

Butcheon,I.E.
Geology & Geophys.
Calgary
Geochemistry and water-rock interaction: Theoretical and applied to economic problems

Butchinson,R.W.
Geology
Western Ontario
Geology, origin and metallogenic relationships of exhalative ore deposits

Bynes,A.J.
Geological Sciences
McGill
Precambrian tectonic studies: Capricorn Orogen and James Bay

Ingram,B.G.
Oceanography
McGill
Effect of environmental changes on estuarine circulation and mixing

Jacobs,J.D.
Geography
Windsor
Palaeoenvironments of the Frobisher Bay area, Baffin Island

James,N.P.
Geology
Memorial
Facies anatomy and diagenetic evolution of Paleozoic carbonates: Northern Maritime Appalachians

Jamieson,R.A.
Geology
Dalhousie
1) Emplacement of ophiolites 2) The Avalon Zone in Nova Scotia

Jensen,O.G.
Mining/Metal. Eng.
McGill
Earth mechanics/Geophysical analysis

Johnson,P.G.
Geography
Ottawa
Mass movement in alpine environments: structure, deformation rates and age

Jolly,W.T.
Geological Sciences
Brock
Metamorphism and geochemistry of the volcanic rocks of the Southern Province of the Canadian Shield and Archean geochemical studies

Jones,B.
Geology
Alberta
Upper silurian and lower devonian brachiopods of Arctic Canada

Jones,F.W.
Physics
Alberta
Electromagnetic induction, heat flow, and Earth tides and tilts

Kaiser,P.K.
Civil Engineering
Alberta
Underground openings in soft, weak rock/mobile debris movements

Kanasewich,E.R.
Physics
Alberta
Geophysical investigation of the crust and mantle

Karrow,P.F.
Earth Sciences
Waterloo
Quaternary chronology and interglacial-interstadial environments

Kay,B.D.
Land Resource Sc
Guelph
Quantitative characterization of mass and heat transfer in freezing soils

Kenney,T.C.
Civil Engineering
Toronto
Connected soil liners to control contaminant migration

Kerrich,R.
Geology
Western Ontario
Thermal and volume history of Archaean oceans with geochemical implications

King,A.F.
Geology
Memorial
Late Precambrian studies on the Avalon Zone of Newfoundland

King,P.H.
Geography
Western Ontario
Soils as paleo-environmental indicators, Canadian Cordillera

Kissin,S.A.
Geology
Lakehead
Crystal chemistry and stabilities of sulphide minerals

Koblak,D.P.
Geology
Toronto
Cavity-dwelling organisms in Paleozoic reefs

Kramer,J.R.
Geology
McMaster
Metal-ligand speciation and particulate interaction in natural waters

Krebes,E.S.
Geology & Geophys.
Calgary
Seismic waves in anelastic media

Kretz,R.
Geology
Ottawa
Geological history of a segment of the St. Lawrence rift system

Krogh,T.E.
Geology
Toronto
Research in geochronology: techniques, tests and applications to geological problems

Krouse,H.R.
Physics
Calgary
Stable isotope fractionation studies

Kukalova-Peck,J.
Geology
Carleton
Morphology and evolution of palaeozoic insects with reference to phylogeny of recent insects

Le Rochelle,P.
Génie civil
Laval
Propriétés fondamentales et comportement des argiles sensibles

Ladanyi,B.
Génie civil
Ecole Polytech.
Propriétés géotechniques des sols gelés et leur comportement en relation avec les fondations et les souterrains

Lafleur,J.
Génie civil
Ecole Polytech.
Résistance au cisaillement des argiles altérées

Lagarec,D.
Géographie
Ottawa
Etude climatique et paléoclimatique, Vallée de Gladstone, Yukon

Lajoie,J.
Géologie
Montréal
1) Sédimentologie de séquences archéennes de la région de Pouyn-Boranda 2) Sédimentologie de séquences aphébiennes de la région des monts Otish 3) Etudes sédimentologiques de roches volcanoclastiques

Lajtai,E.Z.
Geological Eng.
Manitoba
Tensile fracture in rocks

Lambert,F.S.J.
Geology
Alberta
Radiogenic isotope studies in relation to crustal evolution

Langleben,M.P.
Physics
McGill
Drift and thermal regime of sea ice

Langley,D.B.
Surveying Eng
New Brunswick
Geodetic applications of the Canadian VLBI System

Last,W.M.
Earth Sciences
Manitoba
Sedimentology and post-glacial history of saline lakes in Saskatchewan

Laurent,R.
Géologie
Laval
Géologie des complexes ophiolitiques des Appalaches du Québec

Lauriol,B.M.E.
Géographie
Sherbrooke
La couverture neigeuse de l'Ungava entre 1967 et 1980

Lauriol,B.M.E.
Géographie
Ottawa
La couverture neigeuse de l'Ungava entre 1967 et 1980

Lawton,D.C.
Geology & Geophys.
Calgary
Development of the high resolution reflection seismic method

Le Blond,P.H.
Oceanography
British Columbia
Ocean waves and coastal oceanography

LeBrew,E.F.
Geography
Waterloo
Significance of local heat sources on the dynamic climatology of the Beaufort-Laptev Sea Region

Lebel,J.
Océanographie
Québec-Pinsonnault
Hydrogéochimie des estuaires

Leclerc,A.
Chimie
Uné-Chicoutimi
Détermination des métaux en traces tels que Cr, Fe, Mn dans les sédiments du Fiord Saguenay

Lee,D.R.
Earth Sciences
Waterloo
Groundwater contaminant-flux to surface waters

Lefebvre,G.
Génie civil
Sherbrooke
Etude du comportement des argiles structurées

Legault,J.A.
Earth Sciences
Waterloo
Palynostratigraphy of the Lower Paleozoic of Canada

Lenz,A.C.
Geology
Western Ontario
Paleontology, paleoecology, biostratigraphy and stratigraphy of lower paleozoic of Northern and Arctic Canada

Lerbekmo,J.F.
Geology
Alberta
Magnetostratigraphic correlation of Upper Cretaceous to Paleocene sediments; deposition and diagenesis of the Basal Belly River Sandstone

Leroueil,S.
Génie civil
Laval
Comportement général des argiles sensibles et ses applications pratiques

Lespérance,P.J.
Géologie
Montréal
Biostratigraphie de l'Ordovicien Supérieur au Dévonien Inférieur du Québec

Levinson,A.A.
Geology & Geophys.
Calgary
Exploration and environmental geochemistry

Lewis,J.E.
Geography
McGill
Urban climate and land-cover: Surface energy exchange as a function of urban terrain characteristics

Lewry,J.F.
Geology
Regina
Investigation of a possible lower Proterozoic fore-arc and collisional suture zone in northern Saskatchewan

Lo,K.Y.
Civil Engineering
Western Ontario
Thermal stresses and deformations in underground structures

Locat,J.E.
Géologie
Laval
Inter-relations entre la nature, les processus de formation des dépôts argileux et leur comportement mécanique

Logan,A.
Geology
New Brunswick
1) Interspecific aggression in Bermudian corals 2) Benthic hard substrate communities, Bay of Fundy

Long,B.F.N.
IOOS-Océanolog.
Québec-IOOS
Evolution sédimentologique et géomorphologique des estuaires de la côte nord du Golf du Saint-Laurent

Long,D.G.F.
Geology
Laurentian
Sedimentology and stratigraphy of Precambrian sequences

Longstaffe,F.J.
Geology
Alberta
Physico-chemical investigations of water-rock interaction in low-temperature environments

Louden,K.E.
Oceanography
Dalhousie
Earth structure

Luckman,B.H.
Geography
Western Ontario
Little ice age in Jasper National Park

Ludden,J.N.
Géologie
Montréal
Fine-scale evaluation of the petrogenesis and metallogenesis of igneous rocks from Archaean to recent terrains

Ludvigsen,R.
Geology
Toronto
Lower paleozoic trilobite biostratigraphy

Luk,S.H.
Geography
Toronto
Spatial variability of soil loss within small areas

MacLean,W.H.
Geological Sciences
McGill
Origin and mode of emplacement of Noranda-type massive sulfides at Matagami, Quebec

MacRae,N.D.
Geology
Western Ontario
Geochemistry of crustal fusion processes

Mackay,J.R.
Geography
British Columbia
Origin of permafrost and ground ice, Western Arctic Coast, Canada

Macpherson,J.C.
Geography
Memorial
Palynological investigations, Newfoundland

Malpas,J.G.
Geology
Memorial
1) Investigation of ophiolitic and related rocks and comparison to oceanic crust 2) Petrogenesis of Labrador Kimberlites

Manet,B.L.
Géologie
Montréal
Microfaciès carbonatés du Paléozoïque; microfaune et microflore

Mandarino,J.A.
Geology
Toronto
Assessment of the compatibility of mineralogical data

Mansinha,L.
Geophysics
Western Ontario
Earth dynamics/Exploration geophysics

Martignole,J.
Géologie
Montréal
Recherches pétrologiques dans le sud de la province tectonique de Grenville (Québec)

Martin,R.F.
Geological Sciences
McGill
Mineralogical and geochemical adjustments during rock-fluid interaction

Martini,I.P.
Land Resource Sc
Guelph
Quantitative studies of clastic sediments and rocks

Mathews,R.W.
Biolog. Sciences
Simon Fraser
Late-quaternary vegetation and environmental changes in British Columbia

Mathews,W.H.
Geological Sciences
British Columbia
Cenozoic geology and geochronology, British Columbia

Mayer,L.A.
Oceanography
Dalhousie
High-resolution seismic stratigraphy

McCann,S.B.
Geography
McMaster
Morphology, sediments and dynamics of the shore zone

McCaughey,J.H.
Geography
Queen's
Energy and radiation balance studies

McGowan,C.
Zoology
Toronto
Phylogenetic relationships and functional anatomy within selected vertebrate groups, Recent and fossil

McGugan,A.
Geology & Geophys.
Calgary
1) Cretaceous micropaleontology 2) Pennsylvanian Permian stratigraphy 3) Recent foraminifera, West Coast, B.C.

McNutt,R.H.
Geology
McMaster
Radioactive isotope studies on Precambrian rocks

Meagher,E.P.
Geological Sciences
British Columbia
Chemical bonding and crystal chemical studies of minerals

Medioli,F.S.
Geology
Dalhousie
Foraminiferal distribution in coastal and inland marine water and its importance in the study of eustatic sealevel changes

Menzies,J.
Geography
Brock
The mechanics of subglacial sedimentation

Mereu,R.F.
Geophysics
Western Ontario
Deep and shallow seismic sounding research

Miall,A.D.
Geology
Toronto
Analysis of fluvial depositional systems

Michel,B.
Génie civil
Laval
Mécanique et dynamique des glaces de rivière et de lac

Middleton,G.V.
Geology
McMaster
Field and experimental studies of clastic sediments

Miller,H.G.
Physics
Memorial
Geophysical investigations of Newfoundland geology - onshore and offshore

Mitchell,R.H.
Geology
Lakehead
Petrology of kimberlites and alkaline rocks

Mitchell,P.J.
Civil Engineering
Queen's
Model studies of earth structures

Moon,W.
Earth Sciences
Manitoba
Crustal seismology and whole Earth geodynamics

Moore,J.M.
Geology
Carleton
Evolution of the Grenvillian Orogen in Eastern Ontario

Moore,P.B.
Oceanography
Dalhousie
Contribution of atmospheric particulates to oceanic trace metal budgets

Moore,T.R.
Geography
McGill
The biogeochemistry of northern peatlands

Morgan,A.V.
Earth Sciences
Waterloo
Spatial changes in the Canadian insect fauna during the late Pleistocene and recent * with M.A.Morgan (Waterloo)

Morgan,C.
Geography
Guelph
Raindrop size distribution during the course of high intensity variations

Morgan,M.A.
Biology
Waterloo
* Chercheur principal A.V.Morgar (Waterloo)

Morgenstern,N.P.
Civil Engineering
Alberta
Geotechnical behaviour of permafrost, oil sands, and other natural materials

Mossman,D.J.
Geological Sciences
Saskatchewan
Petrology and chemistry of ore deposits

Mossman,D.J.
Geology
Mount Allison
Petrology and chemistry of ore deposits

Mothersill,J.S.
Geology
Lakehead
Paleomagnetic studies of late Quaternary lacustrine and marine sedimentary sequences

Mountjoy,E.W.
Geological Sciences
McGill
Carbonate sedimentation and diagenesis Paleozoic and Holocene reefs and platform margins

Muecke,G.K.
Geology
Dalhousie
Geochemical and isotopic studies on metamorphic and igneous rocks, minerals and ores, using established and newly developed methods of neutron activation analysis

Muehlenbachs,F.
Geology
Alberta
Stable isotope exchange studies and their application to geological problems

Murthy,G.
Physics
Memorial
Paleomagnetic and rock magnetic investigations of intrusive rocks from Labrador and from the island of Newfoundland and the study of implication of these results

Mysak,L.A.
Mathematics
British Columbia
Dynamical oceanography

Naldrett,A.J.
Geology
Toronto
Field and experimental studies of Pt and Ni deposits and their host rocks

Nelson,S.J.
Geology & Geophys.
Calgary
Palaeozoic correlations

Nesbitt,B.E.
Geology
Alberta
Metamorphism and genesis of base metal sulfide deposits

Nesbitt,H.W.
Geology
Western Ontario
The study of silicate mineral-natural brine interactions

Nichol,I.
Geological Sciences
Queen's
Geochemical exploration in Canada

Nicholls,J.M.
Geology & Geophys.
Calgary
Chemical analyses of rocks and minerals, molar volumes of pyroxenes and H2O contents of magmas

Nickling,W.G.
Geography
Guelph
Effects of surface and textural variables on the threshold velocity of sand in air

Nisbet,E.G.
Geological Sciences
Saskatchewan
Studies in Archaean Geology

Nkemdirim,L.C.
Geography
Calgary
Calgary's urban heat island

Noble,J.P.A.
Geology
New Brunswick
Faunal and sedimentary history of the north Appalachian Orogen, Silurian-Devonian

Norris,G.
Geology
Toronto
Biostratigraphy of Mesozoic-Cenozoic miospores and dinoflagellates

Nyland,E.
Physics
Alberta
Geodynamics of slow plate deformation at plate margins

Occhietti,S.
Géographie
Qué-Montréal
Stratigraphie & Paléoenvironnements quaternaires: Vallée et Golfe du St-Laurent

Oke,T.R.
Geography
British Columbia
Climate modification by urbanization

Oldenburg,D.W.
Geophys./Astron.
British Columbia
Inversion and inference of geophysical data

Oldershaw,A.E.
Geology & Geophys.
Calgary
Natural and induced diagenetic relationships in sedimentary rocks

Osborn,G.D.
Geology & Geophys.
Calgary
1) Holocene/late pleistocene glacial chronology and tephrostratigraphy 2) Dynamics of glacier borehrunds

Palmer,H.C.
Geophysics
Western Ontario
Paleomagnetics of late precambrian rock units

Papantonopoulos,C.
Génie civil
Ottawa
Analysis of rock and soil slopes by the generalized limit equilibrium method

Paperik,V.S.
Geology
Memorial
Geology and industrial mineral deposits of volcanic rocks in the Avalon Zone of the Appalachian orogenic belt

Parslow,G.R.
Geology
Regina
*) U and associated elements - their geochemistry & relation to mineralization in W. Sask. 2) Base & Precious metals - their geochem. & relation to mineralization in Flin Flon volcanics

Pearce,T.H.
Geological Sciences
Queen's
Petrology of Archean recent volcanics and applications of laser interference microscopy

Pearce,W.G.
Earth/Planet. Sci.
Toronto
Paleomagnetism of Paleozoic and Quaternary sedimentary deposits

Perrault,G.
Génie minéral
Ecole Polytech.
Recherche en métallogénie, minéralogie et cristallographie

Peterson,R.C.
Geology
Queen's
Charge density studies of mineral structures

Pickerill,R.K.
Geology
New Brunswick
Palaeontology, ichnology, sedimentology and stratigraphy of selected Palaeozoic sequences in Eastern Canada

Platt,P.G.
Geology
Lakehead
Petrogenetic studies of alkaline and related rocks

Poiker,T.K.
Geography
Simon Fraser
Computer-assisted data input for digital terrain models

Pond,G.S.
Oceanography
British Columbia
Inlet and coastal circulation, dynamics and mixing

Price,A.G.
Geography
Toronto
Run-off production and water quality in small hydrologic systems

Pride,C.R.
Geology
Ottawa
Rare earth element geochemistry of "granitic" and volcanic rocks

Protz,R.
Land Resource Sc
Guelph
Pedological research

Quigley,R.M.
Civil Engineering
Western Ontario
Applications of soil mineralogy and physicochemistry

Rafek,M.B.
Geology
Lakehead
*) Palaeobiological study of the Canadian Proterozoic 2) Micropalaeontological study of the Canadian Triassic

Rafek,M.B.
Geological Sciences
Brock
*) Palaeobiological study of the Canadian Proterozoic 2) Micropalaeontological study of Canadian Triassic

Ranalli,G.
Geology
Carleton
Role of rheology in Geodynamics

Rankin,D.
Physics
Alberta
Magnetotellurics and micropulsations

Reardon,E.J.
Earth Sciences
Waterloo
Modelling water chemical evolution in the unsaturated and saturated zones/ion pair dissociation constants/silicate mineral dissolution kinetics

Rees,C.E.
Geology & Chemistry
McMaster
Studies in isotope geochemistry

Reynolds,P.H.
Physics/Geology
Dalhousie
K-Ar, $^{40}Ar/^{39}Ar$ geochronology, paleomagnetism, oxygen isotopic studies

Risk,M.J.
Geology
McMaster
*) Response of reefs to siltation 2) Fine carbonate sediments: Origin & carbon cycles

Riva,J.
Geology
Laval
Taxonomy and biostratigraphy of Ordovician and Lower Silurian graptolites

Rivers,C.J.S.
Geology
Memorial
Metamorphic and structural investigation in the Grenville Province, Labrador and Slave Province, N.W.T.

Roberts,M.C.
Geography
Simon Fraser
The geomorphology and stratigraphy of the alluvial sediments of the lower Fraser River, B.C.

Robin,P.Y.F.
Geology
Toronto
Rock deformation: mechanisms, and effects on fluid flow, metamorphic reactions and melting

Robinson,P.T.
Geology
Dalhousie
The petrology, structure and origin of the ocean crust

Rocheleau,M.
Géologie
Laval
Stratigraphie sédimentologie et géologie économique de la formation de Duparquet d'âge Archéen, Abitibi, Québec

Rochester,M.G.
Physics
Memorial
Theoretical global geophysics and planetary physics

Rodrigues,C.G.
Geology
Windsor
Paleoecologic and stratigraphic significance of foraminiferida ostracoda and mollusca from western Champlain Sea deposits

Roeder,P.L.
Geological Sciences
Queen's
Electron microprobe and experimental study of basaltic rocks

Rogerson,R.J.
Geology/Geography
Memorial
Cirque glaciers in Northern Labrador

Ross,J.V.
Geological Sciences
British Columbia
Structure and mechanical properties of silicate minerals: Structural studies in southern central B.C.

Rouse,G.E.
Botany
British Columbia
Paleogene paleoclimates in southern and interior B.C.

Rouse,W.R.
Geography
McMaster
Energy and water balance studies in the low and high Arctic

Rowe,R.K.
Civil Engineering
Western Ontario
Geotechnical analysis and its implementation in design

Roy,D.W.
Sciences de la terre
Qué-Chicoutimi
Analyse structurale du socle dans la région du Haut-Saguenay, Québec

Roy,M.
Génie civil
Laval
Capacité portante des pieux flottants dans les argiles sensibles

Rucklidge,J.C.
Geology
Toronto
Geological studies using ultra-sensitive and x-ray analysis

Rucklidge,J.C.
Geology
Toronto
* Principal investigator J.Gittins(Toronto)

Ruddick,B.R.
Oceanography
Dalhousie
Oceanic fronts

Russell,L.S.
Geology
Toronto
The Cretaceous-Tertiary transition in central Alberta

Russell,R.D.
Geophys./Astron.
British Columbia
*) Isotopic investigations 2) Geophysical instrumentation

Rust,B.R.
Geology
Ottawa
Studies of alluvial sedimentation in relation to coal deposits

Rutter,N.W.
Geology
Alberta
Amino acid dating techniques and Quaternary history of parts of Alberta, British Columbia, Yukon and Northwest Territories

Ryall,P.J.C.
Geology
Dalhousie
Magnetic properties of sea floor basalts and structure of mid-ocean ridges

Sanderson,M.F.
Geography
Windsor
Trace metals in precipitation - Essex County, Ontario

Sarjeant,W.A.S.
Geological Sciences
Saskatchewan
Fossil dinoflagellate cysts and acritarchs: morphology, evolutionary relationships and application in palaeoecology and biostratigraphy

Saunderson,H.C.
Geography
Wilfrid Laurier
Plume experiments on stratification and hydraulic interpretation of eskers

Scarfe,C.M.
Geology
Alberta
Physical and chemical properties of silicate melts of geological interest

Schenk,P.E.
Geology
Dalhousie
Sedimentologic-stratigraphic studies of the early through late Paleozoics sedimentary rock of Nova Scotia

Schloessin,H.H.
Geophysics
Western Ontario
Physical properties, (mechanical, thermal, electrical, magnetic) of matter under conditions of planetary interiors

Schreier,H.
Soil Science
British Columbia
An assessment of the chemical & spectral variability of terrain & soil mapping units

Schwarcz,H.P.
Geology
McMaster
Isotopic geochemistry

Schwartz,F.W.
Geology
Alberta
Influence of porous medium structure on contaminant transport

Schwarz,E.J.
Mineral Eng.
Ecole Polytech.
History of vertical movements of the Precambrian shield

Schwerdtner,W.M.
Geology
Toronto
Paleostrain analysis in the Canadian Shield

Scott,S.D.
Geology
Toronto
Geology and geochemistry of massive sulfide ores

Sequin,M.K.
Geology
Laval
Paleomagnetism of Quebec Archean greenstone, of Lower Paleozoic American and Baltic Vendian to Devonian rock sequences, and of Avalon microcontinent rock suites

Selvadurai,A.P.S.
Civil Engineering
Carleton
1) Group effects in soil foundation interaction: plane strain and 3-D effects 2) In-situ testing of soils by screwplate and pressuremeter tests

Shaw,D.M.
Geology
McMaster
Geochemical studies of minerals and rocks

Shaw,J.
Geography
Queen's
Sedimentation by rivers and glaciers

Siddiqui,Q.A.
Geology
Saint Mary's
Cenozoic ostracods from drillsites in the MacKenzie Delta and Beaufort Sea

Silverberg,N.
Oceanography
Québec-Rimouski
Sediment accumulation phenomena in the St. Lawrence Estuary

Silvestri,V.
Génie civil
Ecole Polytech.
Résistance au cisaillement des argiles de l'est du Canada

Simony,P.S.
Geology
Calgary
Tectonics of the Rossland arc

Simpson,F.
Geology
Windsor
Cratonic-interior sedimentation and related tectonic controls

Sinclair,A.J.
Geological Sciences
British Columbia
Genetic models for gold deposits in the Canadian Cordillera

Singh,B.
Geography
Montréal
Climatological impact studies pertaining to the creation of large reservoirs, James Bay, Québec

Skippen,G.B.
Geology
Carleton
Geochemistry of pelitic schists and marbles from eastern Ontario: geochemistry of the Notailuk Complex, British Columbia

Sklash,M.G.
Geology
Windsor
Investigation of the role of groundwater in storm runoff

Slawson,W.F.
Geophys./Astron.
British Columbia
Earthquake recurrence rate: Beaufort-Cruickshank Fault, B.C.

Slaymaker,H.O.
Geography
British Columbia
Alpine and Arctic solute and sediment production, transport and yield

Smith,D.G.
Geography
Calgary
Geomorphology and sedimentology of anastomosed river systems

Smith,D.G.W.
Geology
Alberta
Applications of the microprobe in mineralogy, petrology, economic geology and meteoritics

Smith,J.L.
Geological Sciences
British Columbia
Design of data collection and monitoring networks to evaluate point-source contamination of groundwater

Smith,M.W.
Geography
Carleton
Determination of ice content of frozen soils

Smith,P.L.
Geological Sciences
British Columbia
Lower Jurassic biostratigraphy of North America and the geologic history of the northern Bowser basin

Smith,T.E.
Geology
Windsor
Archean magmatism and tectonics: a geochemical study of the evolution of granitic rocks in the Superior Province and subsidiary projects

Saylie,D.E.
Earth Sciences
York
Dynamics of the earth

Sonnenfeld,P.
Geology
Windsor
Evaporite formation

Soulie,M.F.
Génie civil
Ecole Polytech.
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Geology
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Civil Engineering
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Geology
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Geology
Carleton
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Civ Enq/App Mech
McGill
Composition and control of fabric

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Physics
Toronto
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Geology
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Geology
St. F. Xavier
Metal concentrations in coals of Sydney Coalfield

Zodrow,E.L.
Geology
Cape Breton
Metal concentrations in coals of Sydney coalfield

A

Abbey, S., 140
Abel, M.Y., 370
Achab, A., 629, 665, 799, 800
Acton, D.F., 895
Adams, P., 636
Addie, G.E., 593
Adelman, S.A., 206
Adshead, J.D., 670, 1039
Agterberg, F.P., 252, 253
Aitken, J.D., 1090, 1106
Akau, A., 756
Algus, M., 259
Ali, J., 451
Allidrick, D.J., 6, 637
Alley, D.W., 895
Alt, B., 425
Amos, C.L., 994, 1060, 1061
Anderson, A.J., 671
Anderson, G.M., 550
Anderson, J.C., 116, 118, 134
Anderson, T.W., 896
Andrews, A.J., 613, 868, 869
Andriashek, L.D., 898, 920, 930
Anner, A.B., 412
Arafat, N.M., 117
Archer, P., 1096
Archibald, C.W., 638
Armstrong, R.L., 12, 13, 199, 219–222, 237, 244
Arndt, N.T., 622
Arnold, K.C., 423
Ascoli, P., 1153
Aspler, L., 1011
Assad, P., 380
Asselin, P., 639
Attanayake, P., 447
Aubertin, R.A., 351, 513
Austin, R.L., 765
Ayres, L.D., 348, 1232

B

Baadsgaard, H., 186, 224, 225
Babineau, J., 1208
Bachinski, D.J., 837
Bachinski, S.W., 204, 837
Bagnoli, G., 718
Bahr, J., 435
Bailes, A.H., 17
Bailey, B., 619
Bailey, D.G., 79
Bailey, G., 27
Bakalowicz, M.J., 433
Baker, C.L., 899
Baker, T.W.H., 394
Baldwin, D.A., 548
Ball, N.A., 672
Ballantyne, S.B., 187
Bamber, E.W., 715
Banerjee, I., 1012
Bannatyne, B.B., 514, 1127
Banner, J.A., 457, 458
Baragar, W.R.A., 188, 838
Barbash, J., 435
Barendregt, R.W., 1089
Barlow, R.B., 300, 305
Barnes, C.R., 716–719
Barnes, M.A., 147
Barnes, W.C., 147, 1052
Barnett, D.E., 19, 543
Barnett, P., 900
Barr, S.M., 549, 839, 851, 856
Barrett, T.J., 464, 482, 550, 1091, 1154
Barss, M.S., 801
Basinger, J.F., 802
Bassett, T., 467
Batterson, M.J., 901
Bazinet, R., 283–285, 293, 299, 301, 339
Beakhouse, G.P., 105
Beales, F.W., 726
Beattie, E.T., 1173
Beaudoin, A., 189, 700
Beaumier, M., 159, 190
Becker, A., 290
Bédard, P., 568, 603
Béland, J., 181, 1128
Bélanger, D., 435
Bélanger, J.R., 995
Bélanger, M., 51
Béliveau, M., 803
Bell, K., 226
Bell, K.E., 859
Bell, R.T., 551
Bennett, G., 38, 1225
Bérard, J., 370, 382, 891
Berger, G.W., 227, 240
Bernier, M., 996
Best, M.A., 1026, 1044
Betrand, R., 148
Beullac, R., 55
Bhagavatula, V.R., 639
Bigras, P., 125
Bigras, S.C., 116, 118
Binda, G., 260
Bird, J.B., 259
Biron, S. 840, 1107, 1112, 1116, 1118, 1145
Blackburn, D.L. 802
Blackwell, B.L., 776
Blackwood, R.F., 1108
Blake, W., Jr., 902
Blasco, S.M., 465, 903
Blum, N., 565
Boehner, R.C., 1026, 1040, 1109
Boisvert, J.J., 1000
Boivin, L., 706
Bolton, T.E., 720, 1110
Bonn, F., 958, 997–1003, 1005
Booth-Horst, R., 619, 1207
Bornhold, B.D., 1062
Borthwick, A.A., 601
Bostock, H.H., 83, 84, 1226
Bouchard, M., 961
Boucher, M., 552
Boule, C., 652
Bourgeois, J., 425
Bourne, J., 840
Bourque, P.A., 1126
Boville, B.W., 1085
Bower, M.E., 306
Bowins, R., 565
Bowman, W.S., 146
Bowring, S.A., 33, 37, 862
Bowyer-Beaudoin, A., 130
Boyle, D.R., 160
Boyle, R.B., 235
Boyle, R.F., 256
Boyle, R.W., 191
Bozozuk, M., 419
Brackman, A.J., 673
Brangier, M., 52
Brassard, B., 553
Bridgwater, D., 223
Briggs, D.G.E., 726
Brisbin, W.C., 1187, 1215
Brisebois, D., 1111, 1141
Brochu, R., 996, 1001
Brookes, I.A., 904, 963
Brookfield, M.E., 939
Brown, A.C., 554, 555, 559 562, 577, 588, 605
Brown, D., 1151
Brown, R.L., 220
Brown, T.A., 240
Brun, J. 556
Bruneau, H.C., 27, 977, 978
Bryndzia, L.T., 831
Buchan, K.L., 307, 308
Buckley, D.E., 466
Bujak, J.P., 804
Burke, K.B.S., 204
Burton, D.M., 557
Buteau, P., 515

C

Cabri, L.J., 674, 675
Caldwell, W.G.E., 721, 730, 774
Callomon, J., 771
Calvert, S.E., 241
Cameron, A.R., 484–487
Cameron, B.E.B., 722
Cameron, B.W., 723, 1012, 1063, 1064
Cameron, E.M., 192
Campbell, F.H.A., 85, 1092
Campbell, I.H., 841
Campbell, R.B., 63, 1180
Cant, D.J., 620, 621
Card, K.D., 106
Carlyle, L.W., 637
Caron, A., 1112
Carrasco, R., 724
Carroll, R.L., 777–780, 788, 798
Carson, D.M., 716
Carson, M.A., 259, 261, 274, 277
Carson, T., 245
Carter, M.W., 1227
Carter, T.R., 667
Castonguay, J., 1000
Catto, N.R., 905
Cavell, P.A., 842
Cecile, M.P., 1113
Cerny, P., 671, 676, 682, 698 843, 858
Chagnon, A., 677–679
Chainey, D., 558
Chan, D., 383
Chandler, F.W., 1014, 1015, 1093
Chapel, B.E., 297
Charbonneau, B.W., 302
Charbonneau, J-M., 52
Charlesworth, H.A.K., 1174
Chartrand, F., 52, 539
Chase, R.L., 467, 482
Chatterjee, A.K., 560
Chatterton, B.D.E., 725, 740, 741
Chauvin, L., 906
Chen, T.T., 680, 681
Chen, J-Y., 727
Cherry, M.E., 613
Chernis, P., 1218
Chevé, S.R., 561, 562, 640
Chew, H.A.M., 424
Chew, W.-L., 550
Chiarenzelli, J., 1016
Chin, V., 430
Choiniere, J., 161
Chouteau, M., 283
Chowdbury, A., 631
Christiansen, E.A., 895
Christie, K.W., 309, 310
Christie, R.L., 516, 1114
Christopher, J.E., 1155
Chrzanowski, A., 409
Chu, C., 390
Church, B.N., 7, 334, 641 1169, 1228
Churcher, C.S., 963
Churchill, S., 213
Ciavaglia, L.A., 505–507
Ciesielski, A., 86, 111
Cimon, J., 184, 513, 515, 532, 544 552, 553, 575, 578, 580, 593, 604, 640, 658, 661, 662, 669
Clague, J.J., 907, 908
Clancy, J., 528
Clark, A.H., 852
Clark, G.S., 843
Clark, T., 553, 561, 575, 580, 595 640, 642
Clarkson, J.W., 427
Clavet, D., 121
Clément, P., 940
Clough, D., 1003
Coakley, J.P., 909, 910
Cogulu, E., 844
Coleman, L.C., 622
Collins, D.H., 726, 727
Collins, P., 384
Colman-Sadd, S.P., 20
Colvine, A.C., 563, 597, 656
Colwell, J.A., 569, 1013, 1053
Cook, D.G., 1017, 1115, 1212
Cook, F.A., 342
Cooper, B.J., 719
Copeland, M.J., 728
Corfu, F., 230
Corkery, L., 371
Cormier, R.F., 228
Cousineau, P., 1116
Couture, B., 162
Couture, D., 283
Craig, L., 1101
Crawford, R.J., 975
Crockat, J.H., 193, 564–567
Crone, J.D., 286
Cruden, D.M., 392, 404, 408, 415
Culshaw, N.G., 1204
Cumming, G.L., 223, 224
Currie, K.L., 843, 846
Currie, P.J., 778
Currie, R.G., 311

D

Daigneault, R., 568, 1209
Dallmeyer, R.D., 82
Dalrymple, R.W., 1058, 1065, 1066, 1074
Danner, W.R., 8, 883, 1117
Darling, R., 162, 181, 595, 643
Das, B., 405
Davenport, P.H., 163, 172
Davidson, A., 847, 848
Davies, E.H., 805, 806
Davis, D.W., 229–234
Dawson, K.M., 644
Dean, M.E., 27, 28
Dean, P.L., 249, 529, 645
DeBroucker, G., 1118
deCarle, R.J., 367
Decheane, R.G., 1181
Delair, J.B., 822
Delaney, J., 467
Denham, C.M., 354
Densmore, A.A., 623
Dermitsakis, M., 1031
deRomer, H.S., 53
Desjardins, M., 164, 665
Desrochers, A., 1119
Desrochers, D.G., 395, 397
Desmarais, G., 121
Deutsch, E.R., 312–314, 327, 355
Dewez, V., 262
Dhindra, R., 765
Dialow, L.J., 660
Dickman, M., 129
Dickson, W.L., 21
Dietrich, J.R., 624
DiLabio, R.N.W., 569
Dilcher, D.L., 802
Dilles, S., 1026, 1044
Dillon-Leitch, H., 185
Dionne, J.C., 265
Divergilio, M., 1120
Divigalpitiyua, W.M.R., 240
Dixon, J., 1156
Dodds, C.J., 9
Dodds, J., 356
Doig, R., 235, 242
Doggett, M.D., 695
Donaldson, J.A., 807, 1011, 1016 1018, 1037
Donohue, D., 430
D'Orsay, A.M., 1056
Drake, J.J., 263, 396, 431
Dredge, L.A., 911, 912
Dreimanis, A., 942
Dressler, B.O.B., 42, 889
Druce, E.D., 719
Dubé, C., 52
Dubois, J.M.M., 119–121, 264–267, 913 940, 997–1000, 1004
Duffield, S.L., 717, 815
Duke, J.M., 570
Dunn, C.E., 165, 166, 1019
Dunsmore, H.E., 571, 646
Dupuis-Hébert, L., 52
Duquette, G., 572
Durocher, M.E., 194
Dusseault, M.B., 406, 413
Dutton, B., 1022
Dyck, A.V., 287
Dyck, W., 195
Dyke, A.S., 914–916
Dyke, L.D., 371

E

Eade, K.E., 25
Easton, R.M., 26–28, 236
Eastwood, G.E.P., 10, 11, 647, 648
Eberth, D., 1036
Eden, W.J., 419
Edlund, S.A., 808, 917

Edmund, A.G., 781-787, 789, 794
Edwards, G.R., 229, 1232
Edwards, T., 926
Edwards, W.A.D., 317-319
Egan, D.M., 196
Egginton, P.A., 122, 123, 372
Eicher, U., 926
Eisbacher, G.H., 407, 1094
Ekstrand, O.R., 573
Eley, B.E., 809
Elias, R.J., 729
Ellingham, E., 631
Ellis, C., 27, 28
Ellwood, D.J., 197
El-Sabh, M., 997
Elson, J.A., 268, 918
Embry, A.F., 1157
Emory-Moore, M., 1020
Emslie, R.F., 849, 850
Engi, M., 141, 198, 832, 833
Ercit, T.S., 682
Erdman, L.R., 199
Erdmer, P., 76
Ermanovics, I., 77
Ernst, R.E., 200
Estes, J.E., 1005
Evans, B.W., 833
Evans, S., 408, 1169
Evensen, N.M., 659
Eyles, C., 1022-1024
Eyles, N., 1021-1024
Ezra, E., 1005

F

Fabbri, A.G., 254
Fadaie, K., 1218
Fahraeus, L.E., 717, 718
Fahrig, W.F., 313, 316
Falls, R., 696, 881
Farr, J.E., 574
Farvolden, R.N., 357, 432, 919
Faulkner, E.L., 649
Fay, I., 730
Fedikow, M.A.F., 177
Fensome, R.A., 810, 823
Fenton, M.M., 898, 920, 921
Ferguson, L., 731
Ferguson, R.B., 672, 683, 689
Fillon, G., 211
Finamore, P., 922, 923
Fisnici, M.Y., 409
Fisher, D.A., 425
Fisk, L., 297
Fitzgerald, W., 924
Fitzpatrick, M., 1158
Flach, P.D., 1025
Flanagan, M., 79
Flaschlle, P.A., 441
Fligg, K., 295
Foley, P., 1036
Forbes, D.L., 269, 468
Ford, D.C., 270, 282, 433, 444, 453, 579
Ford, M.J., 925
Forest, G., 652
Forster, C.B., 434
Fortescue, J.A.C., 124, 167
Foscolos, A.E., 168, 625, 626
Fox, J.C., 520-522
Pralick, P., 1091
Franconi, A., 51, 52, 54, 56, 892, 1103, 1208-1210, 1230
Franklin, J.M., 650, 651
Fraser, D.C., 358
Fraser, J.A., 87, 870
Frederking, R.M.W., 421
French, H.M., 393, 397, 403, 1043
French, V.A., 851
Friedricksen, H., 464, 1154
Frisch, T., 88, 89
Frith, R.A., 90-92
Fritz, P., 246, 926, 933, 962
Fritz, W.H., 1121
Frosse, E., 871, 872
Fryer, B.J., 217, 676, 842
Fulton, R.J., 927-929
Fumey, L.M., 323
Fyfe, W.S., 48, 488
Fyon, J.A., 467
Fyson, W.K., 668, 1195, 1199, 1204, 1206, 1211

G

Gabert, G., 930
Gabites, J.E., 237
Gabrielse, H., 67, 68
Gadd, N.R., 373, 931
Gagne, R.M., 343
Gagnier, B.-M., 1010
Gagnon, R., 575
Gait, R., 711
Gale, A., 393
Gale, G.H., 178, 548
Galinski, C., 432
Gandhi, S.S., 576
Garcia, E., 852
Gaskill, P., 779
Gauthier, M., 552, 553, 577, 604, 658
Gauthier, R.C., 932
Geddes, R.S., 925
Geldsetzer, H.H.J., 1122, 1123
Gélinas, L., 578, 588, 1103, 1232
Gemmell, D.E., 1142
Gendzwill, D.J., 344, 345
Getsinger, J.S., 12
Geurts, M.A., 262, 803, 811, 812, 821
Ghazban, F., 579
Ghent, E.D., 220, 873, 1181
Gibbins, W.A., 524
Giblin, P.E., 39, 857
Gibling, M.R., 1026, 1040, 1044
Gibson, D.W., 1159, 1160
Gibson, H.L., 218
Gilbert, H.P., 1037
Gilbert, R., 469
Gilboy, C.F., 113
Giles, P.S., 1026
Giovenazzo, D., 684
Girard, A., 580
Giroux, G.H., 251
Glazebrook, V., 887
Gleed, J., 207
Globensky, Y., 1124
Gluszchenko, W.A., 117
Goad, B.E., 676
Gobeil, A.G., 1095, 1096
Godfrey, J.D., 1-4, 201, 336
Godfrey, S.J., 788
Godwin, A., 933
Goff, S.P., 201
Gold, C.M., 708
Good, D.J., 581
Goodacre, A.K., 340
Goodarzi, F., 489, 490, 627
Goodfellow, W.D., 202, 203
Goodrich, L.E., 398, 400
Goodwin, M., 437
Gordey, S.P., 93, 94
Gordon, T.M., 874
Gorton, M.P., 581
Gosselin, C., 678
Goulet, N., 575
Gower, C.F., 78, 79
Goyer, M., 652
Gradstein, F.M., 732, 733
Graham, B.W., 435
Granberg, H.B., 1007
Grant, A.C., 628
Grant, D.R., 934-937
Grant, F.S., 359
Grasty, R.L., 303
Gravenor, C.P., 331, 938, 1027
Gray, J., 275
Greenberg, O.A., 758
Greenhouse, J.P., 357, 432, 919
Greenwood, H.J., 12, 237, 834, 894, 1182
Greenwood, R.C., 48
Grieve, D.A., 491
Gross, G.A., 582, 633
Grunsky, E.C., 107
Guay, F.R., 812
Gulley, P., 525, 545
Gupta, V.K., 337
Gwyn, Q.H.J., 121, 125, 266, 913, 939, 960, 938, 998-1000
Gyenge, M., 410

H

Hacquebard, P.A., 492, 493
Hale, W.E., 204, 1020
Hall, J.M., 890
Hall, R.L., 734
Halley, R.B., 1029
Hallof, P.G., 288
Halls, H.C., 200, 317-319, 321
Hamilton, T.S., 346, 1229
Hamilton, W.N., 248, 583
Hanes, J.A., 238
Hann, B.J., 951
Harakal, J., 221
Hare, F.K., 1085
Harper, C.T., 584
Harrison, R.S., 1028, 1029
Harron, G.A., 696
Hassan, H.H., 204
Hattori, K., 611
Haworth, R.T., 341, 347
Hawthorne, F.C., 676, 682
Hayatsu, A., 320
Haynes, S.J., 387
Hébert, A., 125
Hébert, C., 169
Hébert, Y., 52, 54, 56
Heckel, P., 766
Hedley, D.G.F., 411
Heginbottom, J.A., 374
Helmstaedt, H., 28
Henderson, J.B., 29, 30, 95
Henderson, J.R., 585, 1097, 1196
Herd, R.K., 18, 22
Herget, G., 411
Héroux, Y., 629, 665
Herz, A., 360
Hesse, R., 1033
Hétu, B., 938
Hewitt, R.A., 735
Hiscock, S.R., 941, 942
Higgins, M.D., 142
Hildebrand, R.S., 1197
Hill, R., 1030
Hillebrandt, A., 772
Hills, L.V., 802
Hinzer, J.B., 231
Hiscott, R.N., 695
Hocq, M., 1230
Hodgson, D.A., 943, 944
Hodych, J.P., 320
Hoeve, J., 224, 239
Hoffman, E.L., 654
Hoffman, P.F., 31, 1098, 1198
Holm, P.E., 373, 1205
Hoogendoorn, E.L., 1066
Hooper, K., 736
Hopkins, W.S., Jr., 813
Hora, Z.D., 526-528, 590
Hornbrook, E.H.W., 170
Horodyski, R.J., 807
Horsky, S.J., 156-158
Houde, R., 891
Houston, L., 1007
Howie, R.D., 1125
Howse, A.F., 529
Hoy, T., 655
Hrvoic, I., 361
Hubert, C., 1208
Hudec, P.P., 376-380, 1051
Hudson, B., 519
Huggins, R.B., 108
Hughes, G.M., 436, 437
Hughes, J.D., 694
Hughes, O.L., 617, 903, 945, 946
Hunter, J.A., 348
Huntley, D.J., 227, 240, 241
Hurdle, E., 1199
Hurley, T., 565
Hyde, R.S., 495

I

Imrch, L.I., 53, 1231
Innes, D.G., 1225
Irving, E., 1151
Isachsen, C.I., 13
Iwangwu, J.C., 884

J

Jackson, G.D., 96, 97, 1099
Jackson, H.R., 470
Jackson, K.C., 321
Jackson, L.E., Jr., 126, 127, 947, 948
Jackson, M.C., 40
Jackson, R.E., 435
Jackson, V., 28
Jackson, V.A., 875
Jacob, H.L., 513, 515, 532, 544
Jacobs, J., 448
Jambor, J.L., 685-687
James, N.P., 1047, 1119
Janes, D.A., 108
Janke, L.C.G., 103
Jansa, L., 1047
Jansa, L.F., 1067, 1161
Janusek, B., 1101
Jarvis, G.T., 362
Jerzykiewicz, T., 496
Jiwani, R., 448
Johari, G.P., 401
Johns, G.W., 41
Johnson, D., 725
Johnson, M.D., 633
Johnson, P.G., 132, 260, 272, 280, 281
Johnson, W.M., 205
Johnston, G.H., 398-400
Jonasson, I.R., 149, 171
Jones, J.R., 1064
Jones, P., 893
Jones, S.J., 401, 420
Josenhans, H.W., 471

K

Kaiser, P.K., 381, 385, 418
Kalas, L.L., 133, 951
Kalkreuth, W.D., 497-500, 630
Kalogeropoulos, S.I., 611
Kamenka, L.A., 128, 501
Kang, P.C., 1223
Karrow, P.F., 246, 357, 432, 909, 910, 919, 923, 926, 933, 949-952, 971
Karst, R.H., 511
Kassten, J., 467
Katsube, T.J., 363
Keating, P., 338
Kean, B.F., 586
Keen, C.E., 349, 364
Kennedy, J.E., 822
Kent, D.M., 825
Keppie, J.D., 587
Kerans, C., 1018
Kerr, A., 79
Kerrich, R., 868
Kerr-Lawson, L., 951
Kheang, L., 588
Kilby, W.E., 502
Killeen, P.G., 365
Kilty, S., 338
Kindle, C.H., 702
King, L.H., 1216
King, R.H., 129, 130
Kingston, P.W., 109, 110
Kirby, F.J., 330, 531
Kirkham, R.V., 389
Kish, L., 390, 391
Klassen, R.A., 592, 953-955
Klassen, R.W., 64
Klein, J.D., 288
Knappers, W.A., 322
Knight, I., 23
Knight, J., 173
Koblick, D.R., 472, 473, 737
Kodybka, R.J., 272
Koerner, R.M., 425
Konan, G., 382
Koo, J., 503
Koster, E.H., 1031
Kovac, L.J., 150
Kramer, C.L., 814

Kramer, J.R., 206, 207
Kramers, J.W., 1032
Krebes, E.S., 350
Krishora, J., 759
Krogh, T.E., 230-232
Kromberg, B.J., 488
Kukulova-Peck, J., 738
Kupsch, W.O., 793, 893, 936
Kwong, Y.T.J., 593, 594, 853

L

Lacalli, T., 823
Lachambre, G., 1126
Lachance, G.R., 104
Lachance, S., 572
Lacoste, P., 35
Lacroix, R., 208
Lacroix, S., 593
Laflamme, J.H.G., 674, 675
Lagarec, D., 273
Lajoie, J., 1103
Lalonde, J.-P., 159, 161, 190, 210
Lamarche, R., 164
Lambert, M.B., 854, 855
Lambert, R.St.J., 223
Lamontagne, Y., 289
Lanoetha, D., 56, 1210
Land, H., 746
Langenberg, C.W., 3, 4, 336, 1175
Langford, F.F., 615, 893
Langlais, L., 632
Langley, K., 425
Lantos, J., 725
Lapointe, M.F., 276
Larocque, C.A., 242
Larocque, G.E., 412
Larsson, S., 739
LaSalle, P., 957
Last, W.M., 130, 151, 196, 247, 1068, 1069, 1080
Latham, A.G., 444
Latulippe, M., 352
Lauriol, B., 266, 275, 958, 1000, 1006
Lauriol, B.M.E., 131
Lauziere, K., 56
Lavergne, G., 892
Lavigne, M., 564
Law, K.T., 419
Lazenby, P.G., 290, 366, 367
LeCheminant, A.N., 98, 99, 1016
Leech, G.B., 1183
Lefebvre, D.L., 291, 292
LeGallais, C.J., 1033
Legault, J., 293
Legault, J.A., 815
Leggett, J.K., 1154
Legun, A.S., 504
Leibovitz, D., 709
Lemaitre, S., 273
Lemon, D., 469
Leonardi, G., 793
Lerbekmo, J.F., 225, 323, 884, 887
Lesher, C.M., 841
Leslie, C., 1030
Lesperance, P.J., 741, 1120, 1141
Lessard, G., 267, 939
Leverton, D.R., 132
Levson, V.M., 959
Lewis, C.F.M., 674
Leyland, J., 960
Lichti-Federovich, S., 816
Liebscher, H.M., 438
Lisowiel, M., 368
Lockhart, B., 1069
Logan, A., 475, 476
Loncarevic, B.D., 1217
Long, D.G.F., 488, 1030, 1100
Longstaffe, F.J., 843
Lorrain, P., 339
Lotimer, A., 432
Lourim, J.T., 167
Ludden, J.N., 181, 1232
Ludvigsen, R., 740-745, 755, 762, 768, 773, 775
Luternauer, J.L., 1070, 1071
Lyden, J.W., 396
Lye, J., 445

M

Maathuis, H., 439
Macdonald, A.J., 597, 613, 1091
MacDonald, A.S., 839
Macdonald, D.E., 598
Macdonald, D.W.A., 399
MacDonald, M.A., 180
MacDonald, P., 411
Macdonald, R., 58, 113-115, 226
MacGillivray, J.R., 248
MacInnis, C., 380
MacIntyre, D.G., 600
Mackay, J.R., 276
Mackintosh, A.D., 209
MacLean, B., 477
Maclean, P., 1007
Maclean, P.A., 277
Macnab, R.F., 304
Macnae, J.C., 289
MacPhee, J.A., 505-507
Madden, C.T., 790
Mah, A., 478
Mainwaring, P.R., 690
Makila, A., 538
Male, M., 1128
Maloney, S., 381
Mandarino, J.A., 691-694
Mao, S., 819
Marmont, S., 656
Martineau, G., 961
Martini, I.P., 939
Martins, J.M., 42
Martins, V.M., 857
Mase, C.W., 440
Massey, N.W.D., 43
Masson, G., 1026, 1044
Mathews, W.H., 203, 276, 1170
Matthews, J.V., Jr., 748
Matysek, P., 213
Maurel, L.E., 1176
Maurice, Y.T., 174
Mayr, U., 1129, 1130
McAllister, A.L., 357, 599
McAndrews, J.H., 904
McCabe, H.R., 1127
McCann, J., 688
McClenaghan, W.A., 437
McClung, D.M., 422
McCollor, D.C., 297
McConnell, J.W., 172
McCutcheon, S.R., 75
McDonald, H.G., 789
McDonald, M.M.A., 963
McEwen, J., 183
McGlynn, J.C., 324
McGregor, C.R., 689
McGregor, D.C., 817
McGugan, A., 746
McIlwraith, S., 482
McIntyre, D.J., 818
McKenna, F.P., 460, 463
McLaren, P., 1072, 1073
McNeechan, M.E., 14
McMillan, B., 396
McMillan, W.J., 6, 503, 637, 648
McMullin, D., 856
McMurtry, G., 464
McNeil, D.H., 747
McNutt, R.H., 565
McPhail, D.C., 834
McRitchie, W.D., 348, 1127
McRoberts, G., 565
McTaggart, K.C., 12, 173, 237
Medioli, F.S., 756
Meijer-Drees, N.C., 1131
Meintzer, R.E., 858
Melchin, M., 815
Melczak, J., 667
Mellinger, M., 175
Mercier, A.L., 978, 979
Merrill, G.K., 766
Meyer, J.R., 645
Miall, A.D., 510, 631, 1035, 1036
Miller-Campbell, C., 766
Miller, A.L., 1016
Miller, A.R., 657
Miller, B.B., 950
Miller, H.G., 340, 695
Miller, J.A., 430
Miller, R.F., 962
Mills, A.J., 963
Mirkovich, V.V., 412, 859
Moisiewicz-Zubok, A., 926
Monger, J.W.H., 69
Moore, R.G., 749
Moran, S.R., 1171
Moravec, A., 1218
Morgan, A., 962, 964, 965, 969
Morgan, A.V., 926, 933, 931, 964, 965, 969
Morgenstern, N.R., 381, 383-385, 387, 391, 392
Morin, G., 638
Morrison, E.B., 294
Morrow, D.W., 32, 1132
Morton, R.D., 226, 598
Mossman, D.J., 209, 695-697, 791, 793
Mossop, G.D., 620, 621
Mott, R.J., 820
Motz, J., 965
Mougeot, C., 921
Mucher, H.J., 1088
Mudie, P.J., 736, 966
Mudrock, A., 133
Mugridge, S., 886
Munn, R.E., 1085
Munro, I., 766
Murthy, G.S., 325

N

Nadeau, A., 176, 338, 351, 352, 1096
Naldrett, A.J., 581, 601, 639
Naldrett, D.N., 1043
Nandi, B.N., 505-507
Nantel, S., 532
Nassichuk, W.W., 1133, 1134
Neale, K.L., 1037
Nesbitt, M.K., 8, 883, 1117
Nicholls, J., 860, 861
Nielsen, E., 177, 178
Nisbet, E.G., 622, 1101
Nissen, M., 261
Noble, J.P.A., 734, 886, 1038, 1150
Norford, B.S., 1135
Norris, A.W., 730, 1136
Norris, D.K., 65, 1212
Norris, G., 631, 810, 814, 830
North, B.R., 721
Nowakowski, K.S., 441, 442
Nowlan, G.S., 751
Nunn, G.A.G., 80
Nurkowski, J.R., 508
Nutman, A.P., 223
Nyland, E., 413
Nyman, M., 29

O

Obradovic, M., 449
O'Brien, B., 387
O'Brien, S.J., 1137
O'Driscoll, C.F., 269
O'Hearne, B., 28
Oliditch, A.V., 70, 1200
Oldale, S., 349
Ollerenshaw, N.C., 1184
Olson, D.G., 326
Olson, K., 698
Ommanney, C.S.L., 427
Orchard, M.J., 732, 767
Orpwood, T., 430
Ortiz, T., 479
Ostry, R.C., 459, 460
Otis, M., 52
Ottaway, T., 699
Otto, J.E., 1074
Ouimet, D., 821
Over, J., 725
Overton, A., 353
Owen, V., 876
Owsiacki, L., 44, 868
Ozdemir, O., 313
Ozuray, J., 880

P

Padgham, W.A., 33, 862
Pal, B.K., 333
Palmer, H.C., 318
Palmer, J.H.L., 355, 819
Palonen, P.A., 619
Pantelayev, A.P., 610, 660
Parameswaran, V.P., 402
Parkinson, D.L., 244
Parnandi, M., 425
Parrish, R.R., 220, 222
Parry, T.T., 1007
Patel, I., 1036
Paterson, D.F., 1039, 1057
Paterson, N., 359
Patzold, R.R., 313, 314
Pauk, L., 45
Pawlowski, I.P., 437
Pearce, T.H., 852, 863, 867
Pearson, J.G., 602
Pedder, A.E.H., 1138
Pehme, P., 432
Pelletier, B.R., 967, 1073
Pelletier, M., 210
Pemberton, S.G., 753
Penner, E., 398, 420
Pennock, D.J., 1089
Perla, R.I., 428
Perrault, G., 189, 208, 211, 558, 568, 603, 684, 688, 700
Pesant, A., 1001
Peterson, R.C., 701
Petrie, J., 432
Petruk, W., 702
Petryk, A.A., 112, 330, 968, 1009, 1119, 1120
Picard, C., 32, 1210
Pilny, J.J., 969
Pilote, P., 661
Piper, D.J.W., 680, 1076
Pitcher, D.H., 300
Pittman, D.A., 340
Plant, A.G., 703, 713
Plante, L., 604
Plint, A.G., 1056
Plint-Geberl, H.A., 763
Ploeger, F., 566
Pollard, W.H., 397, 403
Pope, C.S., 734
Poulin, A., 940
Poulton, T.P., 1162
Povondra, P., 676
Powell, T.G., 152
Power, J.M., 429
Prasad, J.N., 327
Prasad, M., 193
Pratt, B.R., 755
Preto, V.A., 491, 504
Price, L.L., 1163
Prichonnet, G., 961
Prime, G., 1040
Pringle, G., 697
Proctor, R.M., 632
Procyshyn, E., 662
Proudfoot, D.N., 1171
Provencher, L., 278
Prowse, T.D., 134
Prugger, A., 344
Pugh, D.C., 100
Puller, K., 207

Q

Quinlan, G.M., 1191
Quinn, L., 29
Quirt, D., 239

R

Raeside, R.P., 877, 1139
Ranalli, G., 1218
Rashid, M.A., 1077
Raudsepp, M., 835
Raven, K.G., 441, 442
Ray, G.E., 13, 179
Reed, P.B., 220
Reedy, E.E., 328
Reed, S.J.B., 704

Rees, T., 565
Reesor, J.E., 71
Reynolds, L., 445
Riccardi, A.C., 772
Richard, J.A., 970, 971
Richard, S.H., 972, 973
Richards, B.C., 1140
Richardson, R.J.H., 533-535
Ricketts, B.D., 509
Ricketts, M.J., 530, 536
Ricketts, R.J., 530
Riggert, V.L., 1177
Riley, J.L., 537
Rimsaite, J.Y.H., 705
Ritchie, J.C., 963
Rive, M., 706
Rivers, T., 875, 876, 882
Robbins, J.C., 145
Robert, P., 605
Robertson, A.H., 1154
Robertson, S., 7
Robinson, J., 901
Robinson, P.T., 890
Roddick, J.A., 72
Rodrigues, E., 295
Rogers, P.J., 180, 989
Roscoe, S.M., 33, 606
Ross, G., 1018
Ross, J.V., 12, 237
Rottenfusser, B.A., 1041
Rouillard, M., 1141
Roulet, N., 396
Rouse, G.E., 158, 1170
Roy, C., 181
Roy, D.W., 892
Ruitenberg, A.A., 607
Rukavina, N.A., 135, 136, 1078
Russell, D.J., 46
Russell, J., 1215
Russell, L.S., 792
Rust, B.R., 1026, 1042-1044
Rutherford, G.K., 1086, 1087,
Rutter, N.W., 128, 776, 898, 903, 939, 974, 975, 1171
Ruzicka, V., 608
Ryall, P., 1047
Ryan, A.B., 81, 1193

S

Sabourin, R.G., 196
Sabourin, R.L.S., 255, 256
Sada, K., 8, 883, 1117
Sado, E.V., 976
St-Julien, P., 1112, 1116, 1118
St-Onge, D.A., 977-979
St-Onge, M.R., 1201
St. Peter, C.J., 1142
Sage, R.P., 663, 664
Sandberg, C., 767
Sanford, B.V., 1163
Sangster, D.F., 609
Sarjeant, W.A.S., 793, 822, 823
Sassano, G.P., 679
Savoie, A., 211
Sawatzky, P., 329
Scafe, M., 445
Schaerer, P.A., 422
Schafer, C.T., 481, 1020, 1079
Schandel, S.E., 880, 881
Schau, M., 101, 864
Schecidar, S.E., 802
Schenk, P.E., 756, 1040, 1045-1047, 1104
Schreiner, B.T., 279, 443, 980, 985
Schrijver, K., 182, 183, 361, 640, 665
Schroeter, T.G., 610, 660
Schwarcz, H.P., 444, 563, 567
Schwartzburg, R., 280
Schwager, C.E., 905
Schwarzbiner, W.M., 631
Schweyen, T.H., 1080
Scoates, R.F.J., 865
Scott, B.P., 59, 60, 115
Scott, D., 393
Scott, D.B., 736-738, 904
Scott, H.P., 467
Scott, K., 222
Scott, S.D., 212, 464, 467, 482, 576, 581, 611, 617, 673, 831, 836
Seaman, A.A., 19
Sego, D.C., 386-388, 393
Seguin, M.K., 330
Seigel, H.O., 145
Seisser, U., 1228
Seuthe, C., 1009, 1010
Seymour, K.L., 794
Sham, P., 538-540
Sharma, K.N.M., 56
Shaw, D.M., 142, 565
Shaw, E., 319
Shetsen, I., 981
Shier, R.M., 297
Shilts, W.W., 137, 982-984, 1068
Shimotani, T., 610
Sibbald, T.I.I., 61
Sibul, U., 445, 454, 455
Siddiqui, K., 739
Simandl, G., 364
Simard, A., 1103
Simony, P., 220, 1102, 1158, 1181
Simpson, M.A., 985
Sinclair, A.J., 213, 250, 257
Sinclair, W.D., 612
Singh, C., 826-826
Sinha, A.K., 296
Sinha, N.K., 421
Skidmore, W.B., 1126, 1128
Skilash, M.G., 446-452
Skwara Woolf, T., 793
Slaney, V.R., 1008
Slawson, W.F., 297, 368
Slivitzky, A., 1145
Smalley, I.J., 986
Smart, C.C., 453
Smedley, J.A., 442
Smith, D.G.W., 214, 704, 707-709, 842, 887
Smith, G.P., 1146
Smith, J.L., 636, 640, 642
Smith, J.V., 676
Smith, J.W.J., 175
Smith, P.K., 587
Smith, R.L., 281
Snowdon, L.R., 153-155
Soffel, H.C., 355
Soles, J.A., 341, 859
Sonnenfeld, P., 1049-1051
Sonnevelt, E., 1052
Sourie, M., 371
Souther, J.G., 221, 666, 1219
Sparkes, B.G., 987
Spencer, R.J., 215
Spratt, D.A., 1173, 1176-1178
Sprenke, K.F., 336
Springer, J.S., 613, 667
Spry, P.G., 836
Srivastava, S.P., 1220
Stalker, A.MacS., 988
Stanley, C., 213
Stauffer, M.R., 622
Stea, R.R., 989
Stearn, C.W., 478, 479, 739, 760, 1033, 1146
Steele, K., 362
Steger, H.F., 146
Stevens, A., 298
Stevens, G.R., 1053, 1221-1223
Stevens, R.K., 718, 1165
Stewart, R.B., 1087
Storer, J.E., 790, 796, 797
Stott, D.F., 1164, 1165
Stott, G.M., 47
Stout, M.Z., 860, 861, 873
Strangway, D.W., 369
Stringer, P., 1188
Strong, D.F., 868
Strulit, L.C., 1147
Stupavsky, M., 331
Suguira, N., 369
Sutcliffe, R.H., 48, 233, 234
Sutherland-Brown, A., 691
Svec, O.J., 335
Sweet, A.R., 827, 828
Sykora, J., 636
Syme, E.C., 17
Symons, D.T.A., 331, 332, 631
Syritski, J.P.M., 1081, 1082
Szymanski, J.T., 710

T

Talkington, R., 218
Tammemagi, H., 843
Tanguay, M.G., 544, 1009, 1010
Tassé, N., 665, 1054, 1055
Tate, L., 1096
Tawashi, A., 1056
Taylor, F.C., 34
Taylor, G.C., 1183
Taylor, P., 464
Taylor, R.B., 483, 1083
Telford, P.G., 337, 633, 1104
Telka, S., 35, 102, 103
Teller, J.T., 990
Tempelman-Kluit, D.J., 1166, 1214
Terasmae, J., 129
Terroux, A.C.D., 118
Tesley, D.J., 231
Thibault, J.J., 543
Thivierge, R.H., 1206
Thode, H.G., 565
Thomas, A., 82
Thomas, D., 62, 866
Thomas, M.W., 98, 114, 115
Thomas, P., 668
Thompson, D., 1002
Thompson, R.I., 66, 1148, 1186
Thomson, S., 389-393
Thorpe, R.I., 216, 614
Thorsteinsson, R., 36, 1149
Thurston, P.C., 40, 48, 49, 217, 1227, 1232
Tipper, H.W., 1167
Teeves, N., 616
Tortosa, D., 615
Tozer, E.T., 761
Tremblay, A., 544
Tremblay, L.P., 616
Trettin, H.P. 104
Trevail, R., 1207
Tripp, R.P., 793
Troop, D.G., 617
Trowell, N.F., 231, 663, 664, 1233
Troyer, D.R., 345
Trudel, P., 284, 301, 603
Try, C.F., 488
Trzcienski, W., 562
Tsui, P.C.W., 615
Tubrett, M., 320
Tuffnell, P.A., 762
Tunnicliffe, V., 467
Turek, A., 293, 652
Turner, J.T., 296
Turner, L., 207
Turner, M.E., 630
Turnock, A.C., 835, 878

U

Unrau, J., 406
Urabe, T., 611
Utting, J., 829
Uyeno, T.T., 717, 763

V

Vallée, M., 299
Valiery, D.J., 454, 455
Van Bosse, J., 184
van de Poll, H.W., 1020, 1056, 1150
van der Flier, E., 488
van der Heyden, P., 220, 222
van der Kamp, G., 456
Van der Leeden, J., 1211
van der Pluijm, B., 1192
Vandervoet, D.G., 530, 531, 536, 901, 987
van Everdingen, D., 632
van Everdingen, R.O., 457, 458
van Loon, G.W., 1086, 1087
Van Schmus, W.R., 33, 37, 862
van Staal, C.R., 1189
Veillette, J.J., 37
Verschuren, C., 109, 110
Vilks, G., 736, 1084
Vincent, J.-S., 991, 992
von Bitter, P.H., 711, 764-767
Vreeken, W.J., 1088, 1089

W

Waddington, J.B., 768
Wade, J.A., 1168
Waheed, A., 310
Wahlroth, J. 27
Waiden, J., 1040
Wall, D.A., 823
Wall, J.H., 769, 770
Wallace, H., 869, 1103
Wan, Pu, 880
Wang, K.T., 459, 460
Wardle, R.J., 82, 1193
Wardlaw, N.C., 634
Wares, R., 669
Warner, B.G., 296, 932
Warren, H.V., 156-158
Watanabe, T., 297
Watkinson, D.H., 185, 218, 618, 893
Watson, D.M., 546, 547
Watts, S.H., 993
Webb, T.C., 1150
Webby, B.D., 719
Weber, W., 232, 1037
Wellstead, C.F., 798
West, T., 1151
Westermann, G.E.G., 729, 735, 759, 771, 772
Westrop, S.R., 794, 795, 773
Weyer, K.U., 461
Wheeler, J.O., 73
Wheeler, J.W., 823
White, G.V., 511
White, J.C., 1224
Whittaker, P.J., 618
Wicks, F.J., 699, 712, 713, 879-881
Wightman, D.M., 1179
Wild, R., 780
Wilkinson, S., 893
William-Jones, W., 669
Williams, D., 50
Williams, G.K., 1202
Williams, G.L., 635
Williams, H., 29, 301, 1194
Williams, P.F., 1189, 1190, 1192
Williams-Jones, A.A., 186, 669
Wilson, A.C., 867
Wilson, J.A., 888
Wilson, J.B., 774
Wilson, J.S., 936
Wilson, M.A., 1057
Wilson, N., 395
Winder, C.G., 488
Wise, M.A., 838
Wittebolle, R.J., 387, 388
Woelfle, J., 968
Wolf, R.R., 1058
Wonderley, P., 882
Woo, M.K., 396
Wood, J., 363, 663, 664
Woodbury, A.D., 462
Woodworth, G.J., 14, 74, 222
Worden, J.M., 224
Worthington, S.E., 282
Wright, J.A., 333, 695

Y

Yakutchik, T.J., 463
Yamshita, M., 298
Yeh, H.-W., 464
Yin, H.A., 899
Yip Choy, R., 369
Yole, R.W., 636, 1151
Yorath, C.J., 1172
Young, G.A., 775
Young, W.M., 334
Yu, Y., 616

Z

Zaitlin, B., 1065
Zaman, A.J., 133, 138, 139
Zippi, P., 830
Zsefrew, E.L., 258, 512, 714, 1152